Vol. 1049 Number 3

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UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

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December 18, 1984

U.S. DEPARTMENT OF COMMERCE

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1042 O.G. 45 on May 15, 1984.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of Feb. 14, 1984 and was announced in the *Official Gazette* at 1039 O.G. 142 on Feb. 21, 1984.

International PCT fees were changed by the PCT Assembly effective Jan. 1, 1984 and were announced in the *Official Gazette* at 1037 O.G. 12 on Dec. 13, 1983.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	620.00
International Fees	
Basic fee (first 30 pages)	295.00
Basic Supplemental fee (for each page over 30)	6.00
Designation fee (for each national or regional office)	70.00

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Apr. 13, 1984.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Dec. 15, 1981 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	None
Utility Patents	4,305,160 through 4,306,314

Reissue Patents based on the above identified patents.

No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 200.00
By other than a small entity . . . . . $ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 50.00
By other than a small entity . . . . . $ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

No Publications This Issue.

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,837,872, Reexam. No. 90/000,668, Requested: Nov. 13, 1984, Cl. 106/74, METHOD OF MAKING WASTES NON-POLLUTING AND DISPOSABLE, Jesse R. Conner, Owner of Record: *National Environmental Controls, Inc., Metarie, La.,* Attorney or Agent: Brown, Murray, et al., Ex. Gp.: 118, Requester: Peter L. Klempay, Arlington, Va.

3,883,334, Reexam. No. 90/000,666, Requested: Nov. 9, 1984, Cl. 65/2, MINERAL FIBER PRODUCTION METHOD AND APPARATUS, Don Cassidy, et al., Owner of Record: *L. C. Cassidy & Son, Inc., Indianapolis, Ind.*, Attorney or Agent: James J. Daley, Ex. Gp.: 133, Requester: Don Cassidy, Indianapolis, Ind.

4,127,598, Reexam. No. 90/000,667, Requested: Nov. 9, 1984, Cl. 260/448.2, PROCESS FOR REMOVING BIPHENYLS FROM CHLOROSTILANES, Harry R. McEntee, Owner of Record: *General Electric Co., Waterford, N.Y.*, Attorney or Agent: Gary L. Loser, Ex. Gp.: 120, Requester: Owner

4,330,296, Reexam. No. 90/000,665, Requested: Nov. 9, 1984, Cl. 23/230, ALBUMIN REAGENT AND ASSAY, Chandra P. Jain, et al., Owner of Record: *Beckman Instruments, Inc., Fullerton, Calif.*, Attorney or Agent: Robert S. Friemen, Ex. Gp.: 130, Requester: Ira C. Edell, Arlington, Va.

4,383,327, Reexam. No. 90/000,664, Requested: Nov. 9, 1984, Cl. 378/019, RADIOGRAPHIC SYSTEMS EMPLOYING MULTI-LINEAR ARRAYS OF ELECTRONIC RADIATION DETECTORS, Robert A. Kruger, Owner of Record: *University of Utah, Salt Lake City, Ut.*, Attorney or Agent: Calvin E. Thorpe, Ex. Gp.: 256, Requester: Picker International, Inc., Cleveland, Ohio

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Erratum

"All reference to Patent No. 4,473,659 to Mark J. O'Hara of Ill. for 'HYDROCARBON CONVERSION CATALYST' appearing in the Official Gazette of Sept. 25, 1984, should be deleted since no patent was granted."

"All reference to Patent No. 4,482,505 to James E. Bunker of Minn. for 'OLEFINIC ESTERS OF PHOSPHORUS CHLORIDES AND BROMIDES' appearing in the Official Gazette of Nov. 13, 1984 should be deleted since no patent was granted."

U.S. GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverage for U.S. companies and may also be available for licensing.

Technical and licensing information on specific inventions may be obtained by writing to:

Office of Federal Patent Licensing
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

Please cite the number and title of inventions of interest.

DOUGLAS J. CAMPION,
Office of Federal Patent Licensing
National Technical Information Service
U.S. Department of Commerce.

DEPARTMENT OF AGRICULTURE

SN 6-620,815. DEVICE FOR SIMULATING STRESS ON PACKAGES DURING COUPLING OF RAILCARS.

SN 6-650,739. METHOD FOR SCREENING BACTERIA AND APPLICATION THEREOF FOR FIELD CONTROL OF PYTHIUM SPP. ON SMALL CROPS.

SN 6-651,563. NONABSORBENT ROLLER APPLICATOR.

DEPARTMENT OF HEALTH AND HUMAN SERVICES

SN 6-321,689 (4,476,462). USE OF CONTEXT TO SIMPLIFY TWO-DIMENSIONAL COMPUTER INPUT.

SN 6-380,471 (4,475,401). VIBRATION DOSIMETER.

SN 6-585,333. T-CELL RECEPTOR-SPECIFIC FOR ANTIGEN POLYPEPTIDES AND RELATED POLYNUCLEOTIDES.

SN 6-632,726. MONOCLONAL ANTIBODY AGAINST HUMAN BLOOD GROUP H TYPE 1 ANTIGEN.

SN 6-639,673. HYDROPHOBIC DENTAL COMPOSITES BASED ON A POLYFLUORINATED DENTAL RESIN.

SN 6-647,728. IMPROVED TOPOSCOPIC CATHETER AND METHOD OF FABRICATION.

SN 6-654,213. SYNTHETIC PEPTIDES FOR THE PRODUCTION OF SPECIFIC KERATIN PROTEINS.

DEPARTMENT OF THE AIR FORCE

SN 6-051,315 (4,441,312). COMBINED CYCLE RAMJET ENGINE.

SN 6-329,560 (4,442,513). SECURITY SYSTEM SIGNAL PROCESSOR.

SN 6-331,750 (4,442,523). HIGH POWER METAL VAPOR LASER.

SN 6-339,257 (4,443,059). HIGH ENERGY LASER MIRROR.

SN 6-347,383 (4,442,453). PHOTO RECONNAISSANCE SYSTEM.

SN 6-356,576 (4,442,293). DI-ACETYLENYL-SUBSTITUTED 2-PHENYLBENZOTHIAZOLES.

SN 6-366,745 (4,440,687). AZIDO NITRAMINO ETHERS.

SN 6-370,232 (4,442,776). DETONATOR BLOCK.

SN 6-417,931 (4,443,349). FLUORINATED ALIPHATIC POLYALKYLETHER LUBRICANT WITH AN ADDITIVE COMPOSED OF AN AROMATIC PHOSPHINE SUBSTITUTED WITH PERFLUOROALKYLETHER GROUPS.

SN 6-431,866. SENSOR SYSTEM.

SN 6-620,211. FLY'S EYE SENSOR NONLINEAR SIGNAL PROCESSING.

SN 6-620,212. SOLAR CELL COVERSLIDE EXTRACTION METHOD AND APPARATUS.

SN 6-624,568. ADAPTIVE MUTUAL INTERFERENCE SUPPRESSION METHOD.

SN 6-627,699. MAGNETOSTATIC WAVE FREQUENCY ANALYZER APPARATUS.

SN 6-629,862. HIGH OR LOW-SIDE SOLID STATE RELAY WITH CURRENT LIMITING AND OPERATIONAL TESTING.

SN 6-629,926. PHASE ONLY ADAPTIVE NULLING IN A MONOPULSE ANTENNA.

SN 6-634,247. DIRECT VIEW HELMET MOUNTED TELESCOPE.

SN 6-634,345. THERMALLY STABLE THERMOSET RESIN COMPOSITIONS.

SN 6-634,346. THERMOSETTING ARYLETHER COMPOUNDS AND THEIR SYNTHESIS.

SN 6-635,393. LPE SEMICONDUCTOR MATERIAL TRANSFER METHOD.

SN 6-636,454. SAFING AND ARMING MECHANISM.

SN 6-640,636. PROPELLANT TANK RESUPPLY SYSTEM.

SN 6-958,920 (4,443,766). PRECISION DIGITAL SAMPLER.

DEPARTMENT OF THE ARMY

SN 6-311,369 (4,447,427). METHOD FOR TREATING BACTERIAL INFECTIONS WITH 2-ACETYL AND 2-PROPIONYLPYRIDINE THIOSEMICARBAZONES.

SN 6-323,626 (4,453,768). PORTABLE RECLINING EXAMINATION CHAIR.

SN 6-338,695 (4,439,012). DUAL-SECONDARY MIRROR CASSEGRAIN OPTICAL SYSTEM.
SN 6-348,462 (4,440,771). 2-ACETYL QUIOLINE THIOSEMICARBAZONES USEFUL IN TREATMENT OF GONORRHEA, MALARIA OR BACTERIAL INFECTIONS.
SN 6-348,539 (4,447,395). SAMPLING DEVICE.
SN 6-394,566 (4,444,119). FAST RESPONSE IMPULSE GENERATOR.
SN 6-423,574 (4,463,680). METHOD OF GENERATING SINGLE-EVENT, UNCONFINED FUEL-AIR DETONATION.
SN 6-455,366 (4,441,942). EMBEDMENT SYSTEM FOR ULTRAHIGH-BURNING RATE PROPELLANTS OF SOLID PROPULSION SUBSYSTEMS.
SN 6-624,564. IMMUNOLOGICALLY ACTIVE PEPTIDES CAPABLE OF INDUCING IMMUNIZATION AGAINST MALARIA AND GENES ENCODING THEREFOR.
SN 6-635,072. VEHICLE ANCHORING SYSTEM.
SN 6-646,535. FUSE STATUS INDICATOR SYSTEM.
SN 6-646,536. CHEMICAL SENSOR MATRIX.
SN 6-647,767. A SINGLE OPTICAL FIBER TELEPHONE SYSTEM.
SN 6-891,255 (4,239,063). MANIFOLD INSULATED WITH KNITTED IMPREGNATED SLEEVE.
SN 6-971,459 (4,220,297). FINLET INJECTOR.
SN 6-972,303 (4,214,156). GYRODYNAMIC FIXTURE FOR MEASURING THRUST FORCE COMPONENTS.

PATENT NOTICES

Certificates of Correction for the Week of Dec. 18, 1984

Re. 31,630	4,422,994	4,447,624	4,460,429
D. 274,934	4,425,191	4,448,507	4,460,477
4,199,574	4,425,657	4,449,014	4,460,627
4,271,063	4,429,361	4,450,011	4,461,264
4,291,623	4,430,486	4,450,371	4,461,358
4,319,299	4,431,374	4,450,453	4,461,642
4,323,573	4,433,307	4,450,455	4,462,104
4,340,391	4,435,834	4,451,374	4,462,383
4,355,154	4,435,852	4,451,529	4,462,532
4,365,075	4,436,673	4,451,789	4,462,632
4,366,938	4,436,798	4,452,539	4,462,748
4,370,671	4,437,023	4,453,765	4,462,981
4,383,499	4,437,646	4,454,875	4,463,183
4,385,285	4,439,622	4,455,929	4,463,273
4,390,611	4,439,969	4,456,909	4,463,300
4,396,873	4,440,323	4,457,299	4,463,451
4,399,606	4,440,632	4,457,591	4,463,613
4,403,897	4,442,074	4,458,138	4,463,850
4,410,960	4,443,187	4,458,726	4,464,260
4,411,242	4,443,661	4,458,740	4,464,386
4,412,211	4,444,527	4,458,800	4,465,209
4,412,341	4,444,565	4,459,230	4,465,696
4,413,300	4,445,979	4,459,796	4,465,841
4,414,332	4,446,789	4,460,084	
4,415,686	4,447,038	4,460,138	
4,422,820	4,447,328	4,460,387	

Disclaimers

3,652,762.—*Alfred Sallmann*, Bottmingen, and *Rudolf Pfister*, Basel, Switzerland. PHARMACEUTICAL COMPOSITIONS AND METHODS EMPLOYING SUBSTITUTED DERIVATIVES OF 2-ANILINOPHENYLACETIC ACIDS AND ESTERS. Patent dated Mar. 28, 1972. Disclaimer filed Oct. 22, 1984, by the assignee, *Ciba-Geigy Corp.*

Hereby enters this disclaimer to claims 5–7, 9–12, 16–19, 22–23, 25–28, 30–32, 34–35, 39–41 and 44–45 of said patent.

4,124,864.—*Leon Stanley Greenberg*, Bridgewater, N.J. PLASTIC ENCAPSULATED SEMICONDUCTOR DEVICES. Patent dated Nov. 7, 1978. Disclaimer filed May 25, 1984, by the assignee, *RCA Corp.*

Hereby enters this disclaimer to claims 9, 10 and 11 of said patent.

4,255,962.—*Leland E. Ashman*, Belmont, Mass. METHOD AND MEANS OF RAPIDLY DISTINGUISHING A SIMULATED DIAMOND FROM NATURAL DIAMOND. Patent dated Mar. 17, 1981. Disclaimer filed July 28, 1981, by the assignee, *Ceres Electronics Corp.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

4,400,303.—*Joel L. Martin*, Bartlesville, Okla. CATALYST FOR OLEFIN POLYMERIZATION. Patent dated Aug. 23, 1983. Disclaimer filed Jan. 26, 1984, by the assignee, *Phillips Petroleum Co.*

Hereby enters this disclaimer to claims 1, 2, 12 and 14 of said patent.

4,410,230.—*Alfonso J. Sanmiguel*, Irvine, Calif. CONNECTOR BLOCK. Patent dated Oct. 18, 1983. Disclaimer filed June 25, 1984, by the assignee, *Holmberg Electronics Corp.*

Hereby enters this disclaimer to the entire term of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 579-5001
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: University of Massachusetts Library	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF November 1, 1984

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	6-18-82
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	9-29-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	1-21-83
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	4-17-82
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—B. R. GRAY, Director	9-27-82
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	8-12-81
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	2-22-82
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	9-29-82
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	4-02-82
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	4-15-82
DESIGN, GROUP 290—K. L. CAGE, Director	6-02-82
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—(Vacant)	12-28-82
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	9-02-82
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	6-08-82
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	8-25-82
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	9-07-82

Expiration of patents: The patents within the range of numbers indicated below expire during November 1984, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,350,718 to 3,355,743, inclusive

Plant Patents ..... Numbers 2,775 to 2,780 inclusive

REEXAMINATIONS

DECEMBER 18, 1984

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,926,832 (283rd)
GETTERING STRUCTURE
Aldo Barosi, Milan, Italy, assignor to S.A.E.S. Getters S.p.A., Milan, Italy
Reexamination Request No. 90/000,450, Sep. 28, 1983.
Reexamination Certificate for Patent No. 3,926,832, issued Dec. 16, 1975, Ser. No. 383,677, Jul. 30, 1973.
Claims priority, application Italy, Aug. 10, 1972, 28053/72
Int. Cl.[3] H01J *7/18*; C22C *1/08*; H01J *35/20, 1/50*
U.S. Cl. 252—181.6

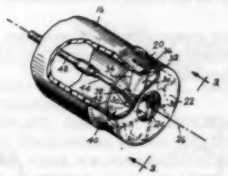
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–5** is confirmed.

New claim **6** is added and determined to be patentable.

1. A gettering structure comprising:
A. a sintered particulate non-evaporable getter metal selected from the group consisting of Zr, Ta, Hf, Nb, Ti, Th and U,
B. a particulate zirconium-aluminum alloy comprising 5 to 30 weight percent aluminum balance zirconium wherein the particles of the zirconium-aluminum alloy are larger than the particles of the non-evaporable getter metal and are distributed throughout the non-evaporable getter metal wherein the weight ration A:B is from 19:1 to 2:3 and wherein said particles of zirconium-aluminum alloy are generally spaced out of contact with each other.

B1 3,963,178 (284th)
SPRAYER NOZZLE
Dean E. Collins, Lowell, Mich., assignor to Root-Lowell Manufacturing Co., Lowell, Mich.
Reexamination Request No. 90/000,501, Feb. 13, 1984.
Reexamination Certificate for Patent No. 3,963,178, issued Jun. 15, 1976, Ser. No. 611,222, Sep. 8, 1975.
Int. Cl.[3] B05B *7/10*
U.S. Cl. 239—8



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–6** is confirmed.

1. A nozzle in combination with a sprayer having a liquid reservoir and a forced air flow source, said nozzle comprising a housing having an annular side wall formed by an axis and having an end wall, said end wall having a circular opening therein generally concentric with said housing axis, a plurality of vane means each having an outer longitudinal edge and an inner longitudinal edge extending between first and second end edges, said vane means having their first end edges positioned adjacent said side wall at generally equal angularly spaced locations about said housing axis, said vane means having their second end edges projecting partially across said end wall opening to expose portions of said vane means outer longitudinal edges, said vane means second end edges terminating at generally equal angularly spaced locations about said housing axis, each vane means second end edge being offset from a radial line extending between said housing axis and the first end edge of the vane means, a disk spaced from said end wall and overlying said vane means at their inner longitudinal edges, said disk having an outer circumferential edge spaced from said housing side wall and a center opening generally aligned with said housing axis, a liquid conduit means connected to said liquid reservoir and extending into said disk opening for directing spray liquid to said housing, an air hose means enclosing said conduit means and having one end engaging said housing side wall and another end associated with said air flow source for directing air into said housing with said air passing between said disk circumferential edge and housing side wall and along said vane means and out said housing end wall opening, said vane means for imparting a whirling motion to said air as it exits said housing end wall opening to cause liquid emitted from said conduit means to strike said vane means and be blown from the vane means at their second end edges and exposed portions of their outer longitudinal edges through said housing end wall opening in atomized form.

5. A method of atomizing a liquid entrained in air for use in low volume spraying, comprising the steps of:
a. introducing forced air between a plurality of angularly spaced vanes spirally directed in their longitudinal dimensions about an axis with said air being directed along the longitudinal dimension of each vane from one end edge to the other end edge of the vane,
b. simultaneously introducing a liquid between said vanes at said axis with said air carrying said liquid onto said vanes, and
c. further directing said air along the direction of said axis across said vanes to cause said liquid to be blown from the vanes in atomized form.

B1 4,182,759 (285th)
ARYLALKYL AND ARYLOXYALKYL PHOSPHONATES AND USE AS ANTIVIRAL AGENTS
Guy D. Diana, Stephentown, N.Y., assignor to Sterling Drug Inc., New York, N.Y.
Reexamination Request No. 90/000,546, Apr. 18, 1984.
Reexamination Certificate for Patent No. 4,182,759, issued Jan. 8, 1980, Ser. No. 912,502, Jun. 5, 1978.
Int. Cl.[3] A01N *9/36*; C07F *9/40*
U.S. Cl. 424—217

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **2–15** is confirmed.

Claim **1** is determined to be patentable as amended.

1. A compound having the formula

$$Ar-Y-\overset{\overset{O}{\|}}{P}(OR)_2$$

wherein

Ar is [phenyl or] phenyl substituted by one or two substituents selected from the group consisting of halogen, lower-alkoxy of 1 to 4 carbon atoms, hydroxy, alkanoyloxy of 1–4 carbon atoms, carbo-lower-alkoxy of 2–4 carbon atoms, carbamyl and carboxy;

Y is $(CH_2)_n$ or $O(CH_2)_n$ wherein n is an integer from 6 to 8; and R is alkyl of 1–6 carbon atoms.

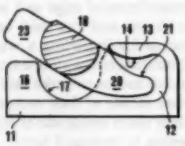
2. A method for combatting viruses which comprises contacting the locus of said viruses with an antivirally effective amount of at least one compound according to claim 1.

B1 4,235,463 (286th)

CLOSURE DEVICE FOR CONTAINER DOORS

Gianfranco Benevenuta, Frax. Data 27, I-10084 Forno Canavese (Turin), Italy

Reexamination Request No. 90/000,407, Jun. 21, 1983.
Reexamination Certificate for Patent No. 4,235,463, issued Nov. 25, 1980, Ser. No. 22,338, Mar. 20, 1979.
Claims priority, application Italy, Nov. 17, 1978, 69624 A/78
Int. Cl.³ E05C 9/08
U.S. Cl. 292—218



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1 and 2 are cancelled.

[1. In a closure device for a container, comprising two lateral posts, an upper bar and a lower bar defining an access opening to the container, two doors closing said access opening, hinges connecting each door to one of said lateral posts, collar supports aligned along the edge of each door remote from said hinges, an upright rod rotatably mounted in said collar supports of each door, an operating handle connected to each said upright rod at a middle position thereof, a catch connected to each end of each said upright rods, and keepers mounted on said upper and lower bars in register with each said catches, the improvement that:

each said keeper has a flat base having a flat forward surface; a first and a second wedge-shaped projections from said base, said flat forward surface of said base being disposed equally on opposite sides of said projections; each said projection being tapered towards the other projection; a seating between said first and second projections defined by a part-cylindrical surface on each said projection substantially tangential to said flat forward surface of said base; and a double flange providing a head extending transversely from said first projection remote from said base; and

each said catch comprises a stem having an at least partially cylindrical cross-section corresponding to said seating of each keeper; a first pair of projections from said stem; a first wedge-shaped space between the projections of said first pair, the cross-section of said first space corresponding to said first wedge-shaped projection of each keeper; a second pair of projections from said stem, substantially opposite said first pair of projections; and a second wedge-shaped space between the projections of said second pair, the cross-section of said second space corresponding to said second wedge-shaped projection of each keeper;

whereby in the closed condition of the container each stem of a catch occupies the seating of a keeper, the wedge-shaped projections of each keeper are wedged in the spaces between the projections of a catch, and the first pair of projections of each catch is positively engaged below the head of a keeper, said head of each keeper having an internal surface, facing the base of the keeper, said surface having a convexly-curved profile, and the projections of the first pair of projections of each catch having an external surface having a concavely-curved profile corresponding to the profile of the internal surface of the keeper head; said pairs of projections having edge surfaces that are substantially tangential to the cylindrical surface of the stem and substantially parallel to and closely adjacent said flat forward surface of the base in said closed condition of the container.]

B1 4,255,421 (287th)

[FORTIMICIN] AMINOGLYCOSIDES, PROCESS FOR PRODUCTION THEREOF, AND USE THEREOF

Isamu Watanabe; Akio Iwasaki, and Toshihito Mori, all of Higashimurayama, Japan, assignors to Kowa Company, Ltd., Nagoya, Japan

Reexamination Request No. 90/000,487, Jan. 18, 1984.
Reexamination Certificate for Patent No. 4,255,421, issued Mar. 10, 1981, Ser. No. 85,058, Oct. 12, 1979.
Claims priority, application Japan, Oct. 18, 1978, 53-127388; Jun. 20, 1979, 54-76768
Int. Cl.³ A61K 31/71; C07H 15/22
U.S. Cl. 424—180

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

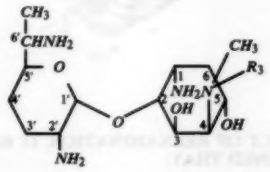
The patentability of claim 5 is confirmed.

Claims 1–4 are cancelled.

New claims 6–13 are added and determined to be patentable.

8. An antibiotic composition which comprises

(i) an antibiotically effective amount of a compound having the following formula



wherein R_3 represents hydrogen, glycyl, carbamoylglycyl or formylglycyl or a pharmaceutically acceptable acid addition salt thereof, and

(ii) a pharmaceutically acceptable diluent or carrier.

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,767

METHOD AND APPARATUS FOR MAKING SHAPED ARTICLES FROM SPRAYED MOLTEN METAL OR METAL ALLOY

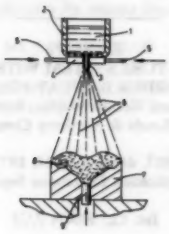
Reginald G. Brooks, Glamorgan, Wales, assignor to Osprey Metals Limited, Neath, Wales

Original No. 3,909,921, dated Oct. 7, 1975, Ser. No. 486,919, Jul. 9, 1974. Continuation-in-part of Ser. No. 297,866, Oct. 16, 1972, Pat. No. 3,826,301. Application for reissue Mar. 19, 1982, Ser. No. 360,050

Claims priority, application United Kingdom, Oct. 26, 1971, 49646/71; Jun. 6, 1972, 26307/72

Int. Cl.³ B22D *23/00*

U.S. Cl. 29—527.2 19 Claims



1. A method of manufacturing a shaped precision article comprising the steps of directing a stream of molten metal or metal alloy onto a spaced collecting surface having a temperature appreciably less than the melting point of said metal or metal alloy, atomizing said stream by subjecting it to high velocity jets of an inert gas having an initial temperature that is appreciably less than that of said molten metal or metal alloy, said gas temperature being such that sufficient heat is extracted by said gas from said molten metal or metal alloy during flight to said surface that said deposited metal or metal alloy forms a coherent deposit and its formation is independent of the other thermal properties of said surface, and working said deposit by a die to form said article.

Re. 31,768

SORTING APPARATUS FOR COLLATING SIMPLEX AND DUPLEX COPIES

Dennis P. Gerbasi, West Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Original No. 3,851,872, dated Dec. 3, 1974, Ser. No. 341,448, Mar. 15, 1973. Continuation of Ser. No. 789,891, Apr. 22, 1974, abandoned, which is a continuation of Ser. No. 630,379, Nov. 10, 1975, abandoned. Application for reissue Mar. 11, 1981, Ser. No. 242,747

Int. Cl.³ B65H *29/60*

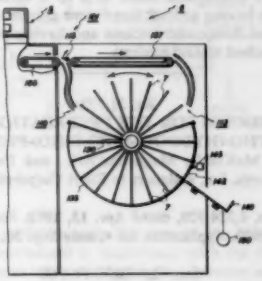
U.S. Cl. 271—291 8 Claims

2. A sheet receiving apparatus for a reproducing machine comprising:

at least one sheet receiving bin, said at least one bin including first and second side members for supporting a sheet in said bin;

means for pivotally supporting said side members for movement between a first orientation wherein said side members are generally inclined from the vertical in one direction and a sheet in said bin is supported by said first side member, and a second and different orientation wherein said side members are generally inclined from the vertical in the opposite direction and a sheet in said bin is supported by said second side member;

means for positioning said side members in said first orientation or in said second orientation; and



means for conveying said sheet to said at least one bin when said side members are supported in either of said first or second orientations.

Re. 31,769

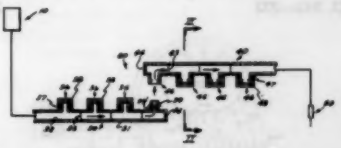
FLUID FLOW CONNECTOR UNIT AND METHOD

Thomas S. Hargest, III, 1078 Winslow Dr., Charleston, S.C. 29412, and William C. Ryan, Jr., 1583 Sanford Rd., Charleston, S.C. 29407

Original No. 4,298,001, dated Nov. 3, 1981, Ser. No. 176,287, Aug. 8, 1980. Application for reissue Jun. 16, 1982, Ser. No. 388,923

Int. Cl.³ A61M *3/00*

U.S. Cl. 604—49 13 Claims



13. A multiple access connector unit comprising a first connector element, said element having a body defining a fluid manifold extending along the length of same, one end of said element being sealed and an opposite end of said element being operatively associable with one of a source of fluid and has a fluid applicator means, said connector element further having a plurality of spacially separate access ports located therealong and extending outwardly therefrom, each said access port defining a fluid passageway therethrough in communication with said fluid manifold, and each access port having removable cover means at an outer free end of same in association therewith to maintain said outer free end of said port sterile while said cover means is initially received thereat, said access ports being adaptable for operable association with a second connector element to establish fluid flow through said unit, said first connector element being adaptable for removal of each associated access port when desired and subsequent association between other ports and a second connector unit, whereby fluid flow to a patient may be disrupted and reinstituted under sterile conditions.

Re. 31,770

DERIVATIZATION OF STAR-BLOCK COPOLYMERS

Ralph Milkovich, Paoli, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Original No. 4,417,029, dated Nov. 22, 1983, Ser. No. 289,556, Aug. 3, 1981. Application for reissue Jan. 13, 1984, Ser. No. 570,567

Int. Cl.³ C08F *297/04*

U.S. Cl. 525—314 **51 Claims**

1. Star-block copolymers of from [25] *10* to 90% by weight of a monovinyl aromatic compound and 10 to [75%] *90%* by weight of a conjugated diene of 4 to 8 carbon atoms; said copolymers having at least three arms connected to a polyvinyl aromatic compound nucleus and having polar functional groups attached to said nucleus.

Re. 31,771

PROCESS FOR THE PREPARATION OF ORTHO-(HYDROCARBYLTHIO)-PHENOLS

Bonnie G. McKinnie, Magnolia, Ark., and Paul F. Ranken, Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Original No. 4,324,920, dated Apr. 13, 1982, Ser. No. 172,977, Jul. 28, 1980. Application for reissue Sep. 30, 1982, Ser. No. 430,553

Int. Cl.³ C07C *148/00*

U.S. Cl. 568—54 **17 Claims**

1. A process for the preparation of ortho-substituted phenols which comprises reacting a phenol having at least one hydrogen on a carbon atom ortho to a hydroxy group with a hydrocarbyl disulfide in the presence of an aluminum phenoxide catalyst so that an ortho-(hydrocarbylthio)-phenol is prepared, the molar ratio of said catalyst relative to said disulfide being between about 0.01 and 0.5.

Re. 31,772

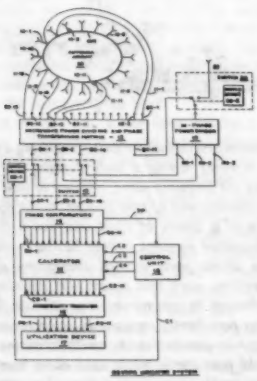
DIGITAL BEARING INDICATOR

Carl W. Gerst, Skaneateles; Hugh A. Hair, Fayetteville, and Stig L. Rehnmark, Skaneateles, all of N.Y., assignors to Anaren Microwave, Incorporated, East Syracuse, N.Y.

Original No. 4,203,114, dated May 13, 1980, Ser. No. 960,243, Nov. 13, 1978. Application for reissue Jan. 22, 1982, Ser. No. 341,914

Int. Cl.³ H04B *7/00*

U.S. Cl. 343—373 **27 Claims**



32. Apparatus for generating a representation of the bearing of a source of microwave energy comprising:

An antenna array means having N antenna elements equispaced about an arc of a circle greater than 180 degrees in a plane for receiving microwave energy, where N is an integer greater than 4;

Microwave power dividing and phase transforming means having N input ports and a set of output ports;

First connecting means for connecting each of the N input ports to a different one of said antenna elements;

A processing means comprising n two-input port phase comparator means, each of said phase comparator means giving a coded combination of binary level signals representing an indication of the phase difference between the signals arriving at their respective input ports, n being an integer greater than 1 and less than N/2, and second connecting means for connecting the input ports of each of said phase comparator means to a different pair of output ports of said microwave power dividing and phase transforming means; and

Ambiguity resolving means connected to said n phase comparator means for converting the coded combinations of binary level signals received in parallel from all said phase comparator means into a multi-digit representation of the bearing of a source of microwave energy, said ambiguity resolving means further comprising calibrating means for initially modifying the coded combinations of binary level signals in accordance with the phase errors introduced by said processor means.

Re. 31,773

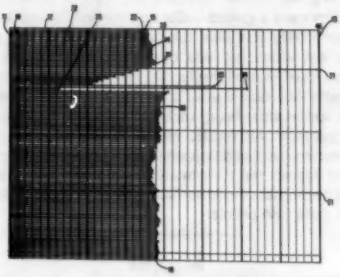
CATHODE RAY TUBE SYSTEM WITH STRIP CHART RECORDER DISPLAY FORMAT

Gerard M. Foley, and Gerald Mosley, both of Melrose Park, Pa., assignors to Leeds & Northrup Company, North Wales, Pa.

Original No. 3,752,917, dated Aug. 14, 1973, Ser. No. 187,300, Oct. 7, 1971. Application for reissue Sep. 28, 1981, Ser. No. 305,864

Int. Cl.³ H04N *7/18*

U.S. Cl. 358—93 **14 Claims**



1. The method of graphically displaying a time variant, digitally sampled, measured variable in moving strip chart format on a cathode ray tube system having an intensity modulated electron beam which traverses the face of the tube along successive scan lines in a raster frame comprising:

a. modulating the intensity of said electron beam at a position in a first scan line of a first raster frame, said position representing the magnitude of said measured variable at a first time,

b. modulating the intensity of said electron beam at positions in successive scan lines of said first raster frame, said positions representing the magnitudes of said measured variable sequentially at times one preceding another, to produce a trend line along said strip chart format representing said measured variable,

c. modulating the intensity of said electron beam at a position in said first scan line of a later raster frame, said position representing the magnitude of said measured variable at a second time,

d. modulating the intensity of said electron beam at positions in successive scan lines of said later raster frame, said positions representing the magnitude of said measured variable at times prior to said later time, [and]

e. repeating the foregoing modulating steps for some subsequent raster frames to produce said moving strip chart format [.]. *and*

f. modulating the intensity of said electron beam in each scan line between a reference position and the position representing the magnitude of said measured variable to produce a display which is brightened between a reference line and said trend line to a lower level of brightness than said trend line.

Re. 31,774

MEASURING SYSTEM

David L. Fletcher, and Walter O. Stadlin, both of North Wales, Pa., assignors to Leeds & Northrup Company, North Wales, Pa.

Original No. 4,240,149, dated Dec. 16, 1980, Ser. No. 12,632, Feb. 16, 1979. Application for reissue Sep. 15, 1983, Ser. No. 532,347

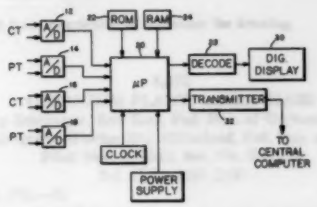
Int. Cl.[3] **G06F** *15/20*

U.S. Cl. 364—483 **5 Claims**

1. The method for measuring a parameter whose value is calculable as the integral with time of a function *other than the identity function of a single variable* of at least one variable which has a value following a periodic wave form, comprising the steps of:

sampling the value of said variable periodically at a frequency asynchronous with said wave form *and not a harmonic or subharmonic of the waveform*; and

periodically calculating the value of the integral of the function in accordance with the sum of the values for the function determined in accordance with the values of all of the samples taken during the time between said calculations.



PLANT PATENTS

GRANTED DECEMBER 18, 1984

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,368

GERANIUM PLANT NAMED FLEDERMAUS

Ingeborg Schumann, Bad Ems, Fed. Rep. of Germany, assignor to Pelargonien-Fischer KG, Hillscheid, Fed. Rep. of Germany

Filed Nov. 2, 1983, Ser. No. 547,883
Int. Cl.³ A01H 5/00
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of geranium plant named Fledermaus, as described and illustrated, and particularly characterized by the combined features of orange-rose flower color, small leaves and relatively small plant size, very fast rooting, excellent branching, and early flowering.

5,369

GERANIUM PLANT NAMED FLIRTPEL

Ingeborg Schumann, Bad Ems, Fed. Rep. of Germany, assignor to Pelargonien-Fischer KG, Hillscheid, Fed. Rep. of Germany

Filed Nov. 2, 1983, Ser. No. 547,891
Int. Cl.³ A01H 5/00
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of geranium named Flirtpel, as described and illustrated, and particularly characterized by the combined characteristics of pink flower color, semi-double flower form, cultivation at temperatures below 12° C., relatively small leaves, early spring flowering response, and by its highly floriferous habit.

5,370

GERANIUM PLANT NAMED FORTUNA

Ingeborg Schumann, Bad Ems, Fed. Rep. of Germany, assignor to Pelargonien-Fischer KG, Hillscheid, Fed. Rep. of Germany

Filed Nov. 2, 1983, Ser. No. 547,895
Int. Cl.³ A01H 5/00
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of geranium plant named Fortuna, as described and illustrated, and particularly characterized by the combined features of red flower color and single flower form, excellent branching, good chlorophyll quality, and low temperature tolerance.

5,371

GERANIUM PLANT NAMED POLKA

Ingeborg Schumann, Bad Ems, Fed. Rep. of Germany, assignor to Pelargonien-Fischer KG, Hillscheid, Fed. Rep. of Germany

Filed Nov. 2, 1983, Ser. No. 547,896
Int. Cl.³ A01H 5/00
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of geranium plant named Polka, as described and illustrated, and particularly characterized by the combined features of carmine red flower color, double flower form, large flowerhead, tolerance to low temperatures, fast rooting, good branching, and early response.

5,372

GERANIUM PLANT NAMED MARS

Ingeborg Schumann, Bad Ems, Fed. Rep. of Germany, assignor to Pelargonien-Fischer KG, Hillscheid, Fed. Rep. of Germany

Filed Nov. 2, 1983, Ser. No. 548,220
Int. Cl.³ A01H 5/00
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of geranium named Mars, as described and illustrated, and principally characterized by the combined features of semi-double flower form and vermilion red flower color, fast rooting, excellent branching, good durability under outdoor summer conditions and good weather resistance, a lack of zonation in the leaves, and by its ability to be cultivated at temperatures below 12° C.

5,373

GERANIUM PLANT NAMED BLUES

Ingeborg Schumann, Bad Ems, Fed. Rep. of Germany, assignor to Pelargonien-Fischer KG, Hillscheid, Fed. Rep. of Germany

Filed Nov. 2, 1983, Ser. No. 548,221
Int. Cl.³ A01H 5/00
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of geranium plant named Blues, as described and illustrated, and particularly characterized by the combined features of fuchsia pink flower color, semi-double to single flower form, cultivation below 12° C., short peduncles, large flowerhead, compact habit, and excellent branching.

5,374

GERANIUM PLANT NAMED SCHöNE HELENA

Ingeborg Schumann, Bad Ems, Fed. Rep. of Germany, assignor to Pelargonien-Fischer KG, Hillscheid, Fed. Rep. of Germany

Filed Nov. 2, 1983, Ser. No. 548,222
Int. Cl.³ A01H 5/00
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of geranium named Schöne Helena, as described and illustrated, and particularly characterized by the combined features of porcelain rose flower color, large flowerhead, very fast rooting, cultivation below 12° C., excellent branching, medium to dark green foliage, and stable peduncles.

5,375

GERANIUM PLANT NAMED OLYMP

Ingeborg Schumann, Bad Ems, Fed. Rep. of Germany, assignor to Pelargonien-Fischer KG, Hillscheid, Fed. Rep. of Germany

Filed Nov. 2, 1983, Ser. No. 548,223
Int. Cl.³ A01H 5/00
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of geranium plant named Olymp, as described and illustrated, and particularly characterized by its semi-double flower form and vermilion red flower color, fast rooting, zoned leaves, large flowerhead, cultivation below 12° C., and by its excellent branching.

PLANT PATENTS

CHARTED DECEMBER 31, 1930

PATENTS

GRANTED DEC. 18, 1984

ERRATA

For CLASS	See PATENT NO.
446–027	4,488,372
446–004	4,488,373
446–220	4,488,374
446–443	4,488,375
128–334	4,488,523
312–039	4,488,654
534–788	4,488,992
534–695	4,489,002
322–035	4,489,290
338–200	4,489,291
363–087	4,489,323
369–032	4,489,398

PATENTS

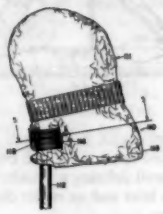
GRANTED DEC. 16, 1924

PATENTS

GRANTED DECEMBER 18, 1984

GENERAL AND MECHANICAL

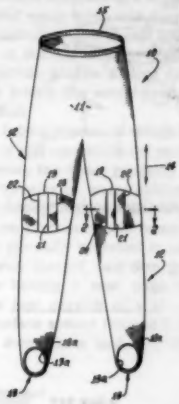
4,488,313
SKI GLOVE
Richard D. Delaney, 12 Parkview Dr., Conneaut, Ohio 44030
Filed Jul. 30, 1982, Ser. No. 403,568
Int. Cl.³ A41D *13/18*
U.S. Cl. 2—17 **5 Claims**



1. A ski pole attachment comprising,
a hand cover,
said hand cover comprising a hand receiving member having an open end and a closed end,
a ski pole,
said ski pole extending through said open end of said hand receiving member,
means to support said ski pole in said hand receiving member,
said hand receiving member being adapted to have the hand of a skier extend through said open end and to grasp a grip on the ski pole with the ski pole and arm of said skier extending from said open end,
and slots are formed in a side of said hand receiving member adjacent said ski pole and a strap extends through said slots and around said ski pole holding said ski pole in position.

4,488,314
PANTLEGGED GARMENT WITH KNEE PROTECTION
C. Erteszek Johnson, Los Angeles, Calif., assignor to Olga Company, Van Nuys, Calif.
Filed Feb. 14, 1983, Ser. No. 466,061
Int. Cl.³ A41D *13/00*
U.S. Cl. 2—23 **4 Claims**

1. A lightweight garment protective of the legs and lower torso during exercise, comprising
(a) a pant with integral tubular legs, said pant and legs comprising lightweight stretch fabric, and
(b) a pad at the knee portion, of each leg, there being layers of said fabric at the inner and outer sides of each pad co-operating to retain the pad to said knee portion and sandwiched between said fabric layers,
(c) each pad consisting essentially of lightweight batting,
(d) said fabric of each leg characterized as elastically stretchable lengthwise of each leg, and in direction about the wearer's leg,
(e) one of said fabric layers formed by the tubular leg, the other layer located at the innerside of said tubular leg and stitched to said leg,
(f) the other layer also being stitched to said one layer through the pad at lengthwise elongated locations which are laterally spaced apart, to define pad folds,
(g) the pad at said elongated locations locally tightly compressed between said layers,
(h) said pad being generally oval shaped, and said elongated locations extending generally longitudinally lengthwise relative to said leg, said pad folds adapting the pad to conform to the rounding of the wearer's knee, there being at least three of said pad folds,



(i) the pad thickness at said elongated locations reduced from between ¼ and ½inch to between 1/16 to ¼ inch.

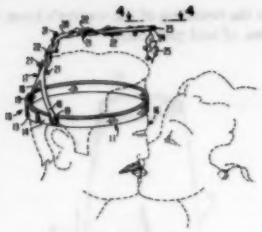
4,488,315
COMBINATION SCARF AND PUPPET
Francesca S. Hoerlein, 701 S. 2nd St., Fairfield, Iowa 52556
Filed Oct. 28, 1982, Ser. No. 437,496
Int. Cl.³ A41D *23/00*
U.S. Cl. 2—91 **10 Claims**

1. An article comprising a flexible elongated scarf with two free ends, said elongated scarf being dimensioned such that it is supportable around the wearer's neck, at least one hand puppet mounted towards one of the free ends of the flexible elongated scarf, said hand puppet including a body with a skirt element containing an internal cavity dimensioned larger than the hand of the wearer thereby to facilitate comfortable manipulation, said skirt including an external opening leading into said cavity, and said opening being dimensioned larger than the hand of the wearer thereby to permit substantially free insertion of the hand of the wearer into said cavity.

4,488,316
MISTLETOE SUPPORTING HEADBAND
Ronald J. Mosca, 4551 W. Sanna St., Glendale, Ariz. 85302
Filed Oct. 17, 1983, Ser. No. 542,739
Int. Cl.³ A42B *0/00*
U.S. Cl. 2—171 **2 Claims**

1. A mistletoe supporting headband, comprising, in combination, an open band for adjustably fitting around a forehead from the rear of a wearer's head, a cantilevered boom affixed upon the rear of said band and extending forwardly therefrom above said wearer's head, to a point above said wearer's face,

a rear end of said boom comprising a bifurcated portion mounted upon sidewardly spreadable rear ends of said band,



and a replaceable mistletoe sprig mounted on a forward end of said boom.

4,488,317

PANTS-LIKE GARMENTS HAVING A SEAMLESS CROTCH CONSTRUCTION

Bernice B. Polsky, P.O. Box 112, Beverly Hills, Calif. 90213

Filed Aug. 16, 1983, Ser. No. 523,720
Int. Cl.³ A41D *1/06*; A41B *9/00*
U.S. Cl. 2—227 **20 Claims**

1. In a garment having a pants section with a waistline and leg portions, the improvement comprising:

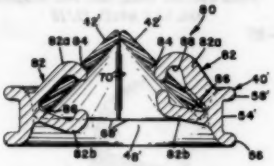
a generally polygonal-shaped crotch piece having a pair of concave front edges and a pair of concave rear edges, one said front edge and one said rear edge located on each side of the center of said garment, said front edges meeting at a point toward the front center of the garment below the waistline and extending from said point generally in a direction away from the front of the garment and the waistline, said rear edges meeting at a point at the rear of the garment and extending from said point generally in a direction away from the rear of the garment and the waistline, said front and rear edges on each side of said garment approaching one another as said edges extend generally away from said waistline.

4,488,318

PROSTHETIC HEART VALVE

Robert L. Kaster, 2730 Vagabond La., Plymouth, Minn. 55447

Filed Apr. 7, 1982, Ser. No. 366,150
Int. Cl.³ A61F *1/22*; F16K *15/03*
U.S. Cl. 3—1.5 **14 Claims**



1. A heart valve prosthesis, comprising:

a base having spaced apart inner and outer circumferential walls, the inner wall defining a circular passageway therethrough with an inlet and an outlet disposed on opposite sides of said base;

the outer wall of said base including a pair of longitudinally spaced apart circumferential flanges defining a predetermined groove therebetween surrounding said base for receiving a sewing ring by which the valve can be sutured in place within a heart;

a plurality of semiconical leaflets that together define a conical valving element with a circular lower edge disposed within the passageway in said base;

asymetrical mounting means for supporting said leaflets on said base for pivotal and translational movement between open and closed positions in response to changes in pressure differential thereacross for flow control through the valve;

said mounting means including an arm secured at one end to said base adjacent to each leaflet and extending away from the outlet to the other end received in a predetermined opening formed on the associated leaflet; and

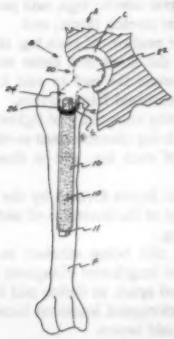
stop means associated with said asymetrical mounting means for limiting opening pivotal movement of said leaflets.

4,488,319

METHOD OF TWO-STAGE IMPLANTATION OF A JOINT PROSTHESIS AND PROSTHETIC PRODUCT

Andreas F. von Recûm, Clemson, S.C., assignor to Clemson University, Clemson, S.C.

Filed Oct. 26, 1981, Ser. No. 314,798
Int. Cl.³ A61F *1/04*
U.S. Cl. 3—1.913 **6 Claims**



1. An improved method for implantation of a joint prosthesis comprising the steps of:

(a) surgically implanting of prosthetic stem in a bone cavity adjacent said joint while avoiding disruption of said joint, said stem being adapted for dynamic bony interfacial fixation along at least a portion of the length of same, a tip of said stem being adapted for receipt of a prosthetic joint element;

(b) permitting adequate dynamic bony interfacial fixation between said stem and bony tissue within said bone cavity for securement of said stem; and

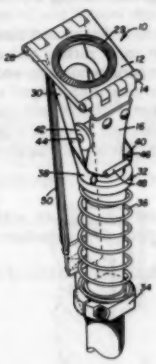
(c) thereafter removing said joint in a second surgical procedure and implanting a prosthetic joint element therefor while securing said joint element to said stem.

4,488,320

PROSTHETIC HIP

Michael T. Wilson, Missouri City, Tex., assignor to Medical Center Prosthetics, Inc., Houston, Tex.

Filed Jan. 10, 1983, Ser. No. 456,617
Int. Cl.³ A61F *1/08, 1/04*
U.S. Cl. 3—15 **3 Claims**



1. An improved flexion biased prosthesis including an upper limb pylon, and a bearing plate adapted for mounting on a hip socket, the improvement comprising:

hinge means for pivotally fixing the upper limb pylon to the bearing plate and capable of permitting said pylon to hyperextend relative said bearing plate;

resilient means for biasing said pylon to a flexed position, said resilient means including a moveable collar disposed about said pylon and a resilient member fixed at one end relative to said pylon and fixed at its other end to said collar so that said collar is biased toward the bearing plate; and,

an actuator member hingedly fixed at one end to said bearing plate distal of the pylon and engageable at said collar to transmit the biasing force to said bearing plate, said actuator member being bifurcated and having legs extending past the center line of each side of the pylon so that the points of engagement with the collar by each leg are generally diametrically opposite.

4,488,321

CONCEALED RECESSED URINAL

Bruce A. Brunton, 1207 N. Sixth St., Chillicothe, Ill. 61523

Filed Apr. 18, 1983, Ser. No. 470,388
Int. Cl.³ E03D *13/00*
U.S. Cl. 4—301 **16 Claims**

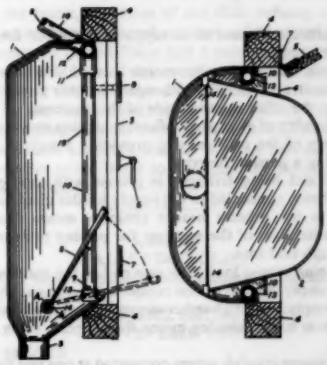
1. A concealed recessed urinal system for use in a home, office, and the like, comprising:

a main frame for mounting the urinal system in a cut-out of a wall of a home, or the like;

a fixed, non-movable receptacle portion mounted in and by said main frame for receiving therein waste products deposited therein, said receptacle having a rear partition, a first side wall partition, and a second side wall partition, said first and second side wall partitions extending from opposite ends of said rear partition and projecting therefrom so as to define a hollow interior portion in which is received the waste products deposited in said receptacle; said recptacle further comprising a funnel-shaped bottom portion projecting away from said first and second side wall partitions and connected to said first and second side wall partitions at the lower edge surface of each, said funnel-shaped bottom portion having an opening formed therein through which the waste products deposited in said receptacle exit;

flushing means, at least a portion of which is mounted in the hollow interior of said receptacle for providing streams of water to flush away the waste products deposited in said receptacle, the streams of water exiting along with the waste products through said opening formed in said funnel-shaped bottom portion of said receptacle;

drip guard means pivotally mounted in said receptacle, in the hollow interior thereof, said drip guard means comprising a plate having a rear edge surface pivotally mounted in the rear portion of said receptacle, and a forward edge surface spaced from said rear edge surface and projecting away from said rear edge surface in a



direction away from said rear partition toward the open front of said receptacle, said plate having a length taken in the direction from said rear edge surface to said front edge surface such that when said plate is in its downward and outwardly projecting position, said forward edge surface projects beyond the boundary of said receptacle through the open front thereof whereby waste products are prevented from being deposited in unwanted places, said plate having a center of gravity such that said plate always tends to pivot about said rear edge surface so as to urge said front edge surface to project outwardly through the open front of said receptacle when said plate is not constrained from pivotal movement;

means for pivotally mounting said rear edge surface of said plate in said receptacle away from the open front thereof; and

closure means pivotally mounted on said main frame for closing off the open front of said receptacle when the urinal system is not being used, said closure means being operatively associated with said plate so that when said closure means are closed to cover up the open front of said receptacle, said plate is caused to pivot such that said forward edge surface of said plate is pivotted away from the open front of said receptacle to lie completely within the hollow interior of said receptacle, so that said forward edge surface cannot project through the open front.

4,488,322

MATTRESS AND BED CONSTRUCTION

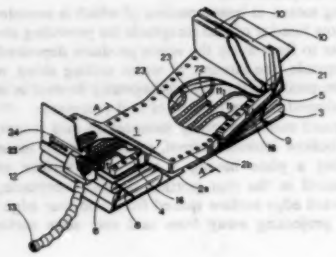
William V. Hunt, 8 Hopmans Close, Lytchett Matrayers Poole, Dorset; John A. Coletta, 1 Priors Rd., Creekmoor, Poole, Dorset; Richard J. Howling, 20 Old Coastguard Rd., Sandbanks, Poole, Dorset, and Leonard C. Higgs, 107 Cologne Rd., Bovington, Dorset, all of England

Filed Feb. 26, 1981, Ser. No. 238,526

Claims priority, application United Kingdom, Feb. 26, 1980, 8006375; Feb. 28, 1980, 8006724

Int. Cl.³ A47C 27/10; A61G 7/04

U.S. Cl. 5—453 **12 Claims**



1. A mattress adapted to be supported on a bed frame, said mattress comprising:

(a) supply header chamber means located along one side of the mattress and exhaust header chamber means located along the other opposed side of the mattress,

(b) a plurality of elongated inflatable air sacs mounted transversely of the mattress and providing a surface for supporting a person thereon,

(c) said sacs being arranged in groups with each group of sacs being connected to the supply header chamber means and to the exhaust header chamber means located on opposite sides of the mattress for passing pressurized air through said sacs,

(d) housing means located at one end of the mattress,

(e) air supply conduit means connected at one end thereof to the supply header chamber means and passing through the mattress to the housing means for coupling to an air supply,

(f) air exhaust conduit means connected at one end thereof to the exhaust header chamber means to discharge air to the atmosphere, and

(g) flow control valve means located to control the flow of air within the air exhaust conduit means.

4,488,323

BED SHEETS WITH HOOK AND LOOP FASTENERS

Harry E. Colburn, P.O. Box 1093, Lake Havasu City, Ariz. 86403

Filed Oct. 23, 1981, Ser. No. 314,279

Int. Cl.³ A47G 9/04

U.S. Cl. 5—460 **2 Claims**

1. In combination with a mattress including a

generally horizontally disposed flat upper surface area on which a person may repose,

flat lower surface area parallel to said upper surface area, and,

vertically oriented side surface of appreciable thickness interconnecting and spanning the distance between said upper and lower surfaces and continuously extending around said mattress, means for covering said mattress with protective layers of material, said means permitting said material to be readily placed on and removed from said mattress and including

(a) a bottom sheet of material having top and bottom surfaces and including

(i) a main central area shaped and dimensioned to correspond to the flat upper surface area of the mattress and having an outer peripheral edge, and

(ii) a marginal area integral with and extending from said peripheral edge of said main area and dimensioned to cover a portion of said side surface of said mattress, said marginal area including

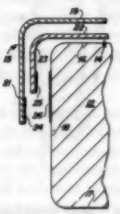
a first strip of hook fastening material extending continuously along said marginal area generally parallel to said peripheral edge of said main area of said sheet, said hook strip being attached to said bottom surface of said bottom sheet, and

a peripheral edge positioned adjacent said vertically oriented side surface between said upper and lower surfaces of said mattress when said bottom sheet is properly positioned on said mattress, said peripheral edge of said marginal area generally being spaced apart from said peripheral edge of said main central area of said bottom sheet by a selected distance less than said distance between said upper and lower surface areas of said mattress;

(b) a top sheet of material having top and bottom surfaces and including

(i) a main central area shaped and dimensioned to correspond to the flat upper surface area of the mattress and having an outer peripheral edge, and

(ii) at least one marginal area integral with and extending from said peripheral edge of said main area of said top sheet and dimensioned to cover a portion of said side surface of said mattress, said marginal area including



a second strip of hook fastening material extending continuously along said marginal area of said top sheet generally parallel to said peripheral edge of said central area of said top sheet, said second strip of hook material being attached to said bottom surface of said top sheet,

a peripheral edge positioned adjacent said vertically oriented side surface between said upper and lower surfaces of said mattress when said top sheet is properly positioned on said mattress over said bottom sheet, said peripheral edge of said marginal area of said top sheet generally being spaced apart from said peripheral edge of said main central area of said top sheet by a selected distance

greater than said distance between said peripheral edge of said marginal area of said bottom sheet and said peripheral edge of said central area of said bottom sheet, and

no more than said distance between said upper and lower surfaces of said mattress,

said second strip of hook material generally being positioned on said top sheet a distance from said peripheral edge of said central area of said top sheet greater than said distance between said peripheral edge of said marginal area of said bottom sheet and said peripheral edge of said central area of said bottom sheet;

(c) means for fixedly detachably securing said first and second strips of hook material in position adjacent said side portion of said mattress, said securing means including

first and second strips of loop material attached to and extending continuously along said side surface of said mattress such that

(i) said first strip of hook material is attached to said first strip of loop material when said bottom sheet is properly positioned on said mattress,

(ii) said second strip of hook material is attached to said second strip of loop material when said top sheet is properly positioned on said mattress,

(iii) said first and second strips of said loop material are generally parallel to one another and to said upper and lower surfaces of said mattress,

(iv) said first strip of loop material is attached to said side surface of said mattress above said second strip of loop material.

(v) said first and second hook strips generally lie in a common vertical imaginary plane when attached to said first and second loop strips, and

(vi) said marginal area of said top sheet between said first hook strip and said peripheral edge of said central area of said top sheet is adjacent and generally contacts said marginal area of said bottom sheet when said first and second hook strips are attached to said first and second loop strips.

4,488,324

MEANS FOR SPANNING THE JOINT BETWEEN ADJOINING STRUCTURAL MEMBERS OF A BRIDGE OR LIKE STRUCTURE

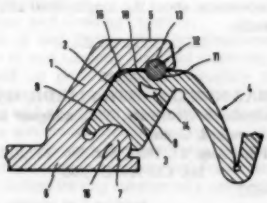
Alfred Hartkorn, Kolpingstr. 25, 8068 Pfaffenhofen/Ilm, Fed. Rep. of Germany

Filed Mar. 19, 1982, Ser. No. 359,879

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1981, 3116429

Int. Cl.³ E01D *19/06*; E01C *11/10*

U.S. Cl. 14—16.5 **4 Claims**



1. In the combination of bridge structural members or the like and resilient joint spanning bodies, the improvement comprising:

(a) a structural member longitudinal edge having a recess between an upper and lower projection, said lower projection being formed into an upwardly facing semicircular lip spaced away from said recess, and shaped to form a smooth and continuous curved surface over said semicircular lip and into said recess, and said upper projection having a semicircular groove downwardly facing;

(b) a resilient joint spanning body having a rounded projection for slidable engagement into said recess over said semicircular lip, and having a semicircular cavity adjacent said rounded projection, said projection and said cavity together shaped to form a smooth and continuous curved surface, which surface is substantially complementary to said curved surface over said semicircular lip and into said recess, thereby to form mating smooth surfaces to facilitate slidable engagement between said joint spanning body and said structural member; said joint spanning body further having an upwardly facing semicircular groove in confronting relationship to said structural member downwardly facing semicircular groove when said joint spanning body is fully slidably engaged with said structural member; and

(c) a fastening key in said confronting semicircular grooves.

4,488,325

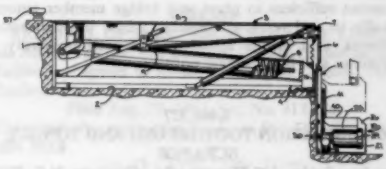
TRUCK LOCKING DEVICE

David E. Bennett, Waukesha, and Joseph R. Driear, Thiensville, both of Wis., assignors to Kelley Company Inc., Milwaukee, Wis.

Filed Apr. 12, 1982, Ser. No. 367,296

Int. Cl.³ E01D *1/00*; B65G *69/00*; B60D *7/00*

U.S. Cl. 14—71.3 **18 Claims**



1. A locking device for locking a movable structure to a fixed structure, comprising a frame mounted on the fixed structure, a slide mounted for vertical sliding movement with respect to the frame, a portion of the slide defining a locking element, a gear member, a rack member, a first of said members being connected to said frame and a second of said members being connected to said slide, and reversivble drive means carried by said slide and operably connected to said second member for moving said slide upwardly in a linear direction to bring said locking element into engagement with an abutment on said movable structure and for moving said slide downwardly relative to the frame to disengage the locking element from said abutment.

4,488,326

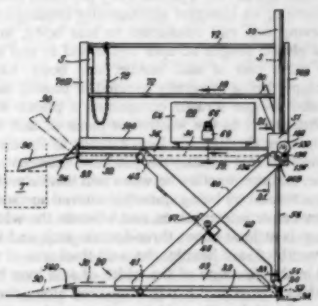
PALLET DOCK LIFT

Charles W. Cherry, Edmond, Okla., assignor to Autoquip Corporation, Guthrie, Okla.

Filed Sep. 30, 1982, Ser. No. 431,249

Int. Cl.³ E01D *1/00*

U.S. Cl. 14—72.5 **33 Claims**



8. In an ambulatory dock lift having a base and a loading platform which can be raised and lowered with respect to said base, the improvement comprising a retractable throw-over bridge system for joining the loading platform to an adjacent loading surface such as a truck bed or the like, said bridge system comprising:

an elongate bridge member of a predetermined weight joined at a pivot point to one end of said loading platform and being pivotal between an upright retracted position

through an intermediate position above the horizontal and lowered position below horizontal, and having a selected length so that said bridge member will span a selected space between the loading platform and an adjacent loading surface;

a bridge retractor assembly joining siad bridge member to said platform, said retractor assembly including biasing means for applying a lifting force to said bridge member at a selected lifting point to bias said bridge member upwardly toward said upright retracted position;

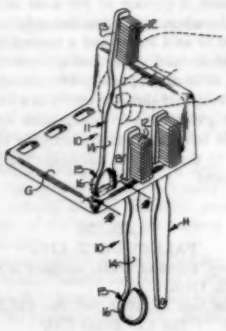
said lifting force of said biasing means being of a value in relation to the weight of said bridge member such that said lifting force is initially insufficient to pivot said bridge member upwardly from said lowered position and becomes sufficient to pivot said bridge member automatically to said retracted position when, through external forces, said bridge member is pivoted upwardly and reaches said intermediate position.

4,488,327

COMBINATION TOOTHBRUSH AND TONGUE SCRAPER

C. Jennings Snider, 232 Cherokee Rd., Charlotte, N.C. 28207

Filed Jun. 1, 1983, Ser. No. 500,143
Int. Cl.³ A46B 9/04
U.S. Cl. 15—111 **1 Claim**



1. A toothbrush having a plastic body provided with rows of bristles thereon, an elongate substantially rectangular plastic handle having one end connected to said body, and means defining a plastic tongue scraper connected to and extending from the other end of said handle, said body, handle and tongue scraper being integrally molded of plastic, said means defining said tongue scraper comprising a plastic loop positioned substantially in the widthwise plane of said handle so that the opening through the loop extends in the direction of the thickness of said handle, the juncture between said body and handle, and the juncture between said handle and loop are each characterized by being smoothly curved surfaces devoid of any crevices or interruptions, and wherein the width of the plastic loop is at least about three-fourths inch and is greater than the width of said handle, the wall thickness of said loop measured in the direction of the width of said loop being less than the thickness of said handle measured along the shortest dimension of said handle, said loop being substantially oval shaped in plan to facilitate passage of the loop through aperture of a toothbrush holder, the length of said handle being many times the length of said oval shaped loop taken longitudinally of said handle, the opposing faces of said loop having scraping edges defined by tapered edges, and wherein the flexural rigidity of said plastic loop is such as to maintain the loop in open condition during usage as a tongue scraper and to permit widthwise deflection of the loop to reduce the width of the loop when the toothbrush is being passed through an aperture of a conventional toothbrush holder, whereby the presence of the tongue scraper on the toothbrush does not prevent the toothbrush being stored in a toothbrush holder when in nonuse.

4,488,328

FLOATING HEAD TOOTHBRUSH

Richard M. Hyman, P.O. Box 552, Iowa City, Iowa 52244

Filed Jan. 24, 1983, Ser. No. 460,567
Int. Cl.³ A46B 9/04
U.S. Cl. 15—167 R **15 Claims**

1. A tooth brush comprising,

an elongated handle,

a brush head including a base having a face surface, a back surface and side edge surfaces extending between said face and back surface, and brushing bristles projecting from said face surface,

a pair of laterally spaced arms projecting from one end of said handle in laterally spaced relation to said side edge surfaces on opposite sides of said base, said arms cooperating with said handle to define a yoke for supporting said brush head, and

mounting means extending between each of said arms and the adjacent said side edge surface of said base for supporting said brush head in said yoke,

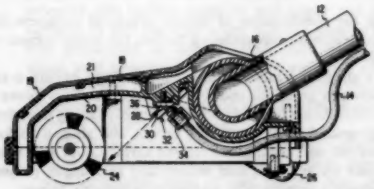
said mounting means normally maintaining said brush head in a first position with said face surface generally parallel to said arms and being capable of limited torsional deflection to permit limited pivotal movement of said brush head from said first position about a pivot axis extending transversely of the longitudinal axis of the handle and being sufficiently rigid in bending to prevent substantial pivotal movement about the longitudinal axis of said elongated handle.

4,488,329

POWER SPRAY NOZZLE WITH FLUIDIC OSCILLATOR

Elliot A. Lackenbach, Somerset, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Aug. 11, 1982, Ser. No. 407,022
Int. Cl.³ A47L 5/00
U.S. Cl. 15—322 **3 Claims**



1. A power spray device for a carpet cleaning machine having a source of vacuum and of liquid, said device comprising: a housing; first means for connecting said housing to said source of vacuum; second means for connecting said housing to said source of liquid; a plenum chamber in said housing communicating with said first means, liquid return orifices in said housing adjacent a carpet to be cleaned and in communication with said plenum chamber; a floor brush rotatably supported in said housing adjacent said liquid return orifices; means for selectively rotating said floor brush; and a fluidic oscillator connected with said second means, means for securing said fluidic oscillator in fixed relationship within said hous-

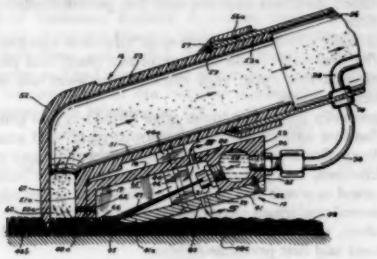
ing, said fluidic oscillator including an outlet port directed toward said carpet adjacent said floor brush for selectively spraying said liquid on said carpet.

4,488,330

RUG AND UPHOLSTERY CLEANING APPARATUS

Dale L. Grave, 125 Queensland La. North, Plymouth, Minn. 55447

Filed Nov. 12, 1982, Ser. No. 440,950
Int. Cl.³ A47L *11/34*
U.S. Cl. 15—322 **7 Claims**



1. In connection with a rug and upholstery material cleaning apparatus, a nozzle structure comprising

a housing having a peripheral portion overlying a surface portion to be cleaned of said material,

a cleaning chamber and a suction chamber within said housing,

means separating said chambers positioned to provide communication therebetween at said surface portion to be cleaned,

outlet jets carried in said cleaning chamber ejecting cleaning fluid at such an angle as to pass through said material at said surface portion to be cleaned,

said cleaning fluid being directed to sweep through and align said surface portion,

air ports into said cleaning chamber,

the suction of said suction chamber simultaneous with the ejection of said cleaning fluid and incoming stream of air from said air ports raising said surface portion to be cleaned and withdrawing said cleaning fluid from and drawing said air stream through said raised surface portion in a continuous cleaning action

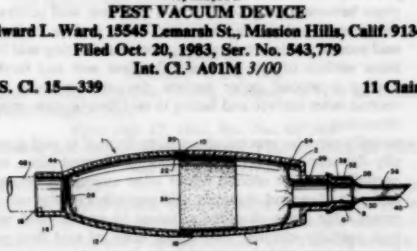
whereby said cleaning fluid and said air stress are under constant movement in being withdrawn and discharged by said suction leaving substantially only dampness in said surface portion as a residue.

4,488,331

PEST VACUUM DEVICE

Edward L. Ward, 15545 Lemarsh St., Mission Hills, Calif. 91345

Filed Oct. 20, 1983, Ser. No. 543,779
Int. Cl.³ A01M *3/00*
U.S. Cl. 15—339 **11 Claims**



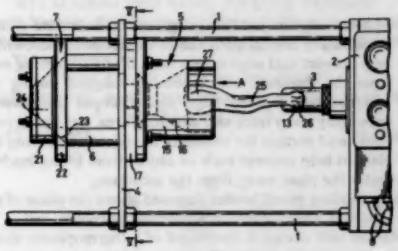
1. A pest disposal device comprising the combination of: a hollow housing having an interior cavity defined by a first tubular housing member having a first extending, elongate portion having a first aperture adapted to be attached to a nozzle or the like and an opposite first open end, and a second tubular housing member having a second extending, elongate portion having a second aperture adapted to be connected to a vacuum source and an opposite second end, said first open end of said first tubular housing member and said second open end of said second tubular housing member being releasably engaged to form said hollow housing; a tubular air permeable filter bag having a first closed end and an opposite extending, elongate end having an aperture adapted to project outwardly through said first aperture of said first tubular housing member for securement therewith and retained within said housing; said filter bag having an adhesive area on the interior surface of said tubular filter bag intermediate said first closed end and said opposite extending, elongate end.

4,488,332

REMOVAL OF MEAT FROM POULTRY LIMBS

Louis Atteck, Harrow, and David N. Wilson, Hellesdon, both of England, assignors to Bernard Matthews Limited, Norfolk, England

Filed Aug. 27, 1982, Ser. No. 412,276
Claims priority, application European Pat. Off., Sep. 22, 1981, 81 304 352.8
Int. Cl.³ A22C *17/04, 21/00*
U.S. Cl. 17—46 **15 Claims**



1. A method of removing meat from a bone of a poultry limb having a first end and a second end, comprising:

clamping said first end of said poultry limb into a forward end of a ram with said second end of said poultry limb extending away from said ram in an axial direction with respect to said ram; and

axially advancing said ram and poultry limb through a first aperture in a first stripping device so that said meat is turned back over an outer periphery of said ram and falls away from or is readily removed from said ram.

5. Apparatus for removing meat from a bone of a poultry limb having a first end and a second end, comprising:

a ram comprising a clamping device in a forward end thereof for clamping said first end of said poultry limb;

a first stripping device comprising a first aperture axially forward of said forward end of said ram;

said first aperture being adapted to allow axial passage of said bone and said forward end of said ram therethrough while stripping said meat away from said bone and turning said meat over an outer periphery of said ram;

at least said forward end of said ram being adapted to advance axially through said first aperture.

4,488,333

LASH DEVICE

Richard J. Tracy, 1002 Forest Dr., Elgin, Ill. 60120

Filed Aug. 12, 1982, Ser. No. 407,436
Int. Cl.³ A41F *1/00*
U.S. Cl. 24—140 **4 Claims**

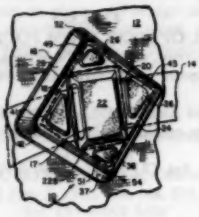
1. A lash device adapted to restrain a strap, or the like, to a substrate, comprising:

a thin stiff flexible plate adapted to be attached to the substrate in overlying engagement therewith;

said plate having means for restraining the strap;

said plate having an outwardly flared peripheral tapered edge means being disposed at the underside of said plate and defining a recessed surface area on said underside, said edge means having a narrow bottom surface adapted to engage the substrate;

said plate having an attaching area adapted to be fixed to the substrate to attach said plate thereto and thereby to flex said plate to cause said recessed underside surface to be pressed into overlying engagement with the substrate and thereby to press said narrow bottom surface of said peripheral edge means firmly against the substrate along a substantially continuous line of engagement therewith to help prevent said edge means from lifting or curling away from the substrate and becoming snagged during use;



wherein said tapered edge means slopes downwardly outwardly away from said attaching area, and has an outer contoured surface for camming an object away from said plate to help prevent such an object from lifting inadvertently the plate away from the substrate;

an upstanding raised border disposed above the plane of said attaching area for thread protecting purposes; and

wherein said device is composed of a thermoplastic elastomeric material, and is of an integral one-piece construction.

4,488,334

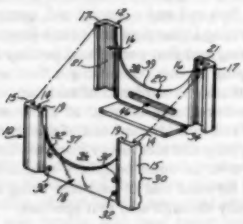
U-BOLT CLAMP SADDLE CONSTRUCTION AND METHOD OF MANUFACTURE

Ronald D. Goforth, Bloomfield Hills, Mich., assignor to Metal Craft Company, Troy, Mich.

Filed Jan. 11, 1982, Ser. No. 338,698

Int. Cl.³ F16L *33/10*

U.S. Cl. 24—277 **8 Claims**



1. A U-bolt clamp saddle for assembly to a U-bolt having two parallel elongated ends and a radiused portion intermediate said two parallel elongated ends, said U-bolt clamp saddle comprising:

a first preformed piece formed from a first single metal sheet;

a pair of first channels formed on either end of said first preformed piece, said pair of first channels being generally U-shaped and square, said pair of first channels further being disposed parallel to each other, both of said pair of first channels opening in a first predetermined direction;

a pair of first outside edges for said pair of first channels, said pair of first outside edges being disposed parallel to each other, each of said pair of first outside edges extending from the one of said pair of first channels associated therewith in said first predetermined direction;

a generally flat first web formed in said first preformed piece between said pair of first channels, said generally flat first web having a first inner surface facing in said first predetermined direction and a first outer surface disposed opposite said first inner surface and facing in a second predetermined direction opposite said first predetermined direction;

a partially circular first upper edge formed in said generally flat first web of said first preformed piece, said partially circular first upper edge extending between said pair of first channels;

a generally linear first lower edge formed in said generally flat first web of said first preformed piece, said generally linear first lower edge extending between said pair of first channels, said generally linear first lower edge being disposed opposite said partially circular first upper edge;

a second preformed piece formed from a second single metal sheet, said second preformed piece being disposed adjacent said first preformed piece;

a pair of second channels formed on either end of said second preformed piece, said pair of second channels being generally U-shaped and square, said pair of second channels further being disposed parallel to each other, both of said pair of second channels opening in said second predetermined direction, said pair of second channels being aligned with said pair of first channels to define therebetween a pair of parallel box-shaped passageways for passage therethrough of said two parallel elongated ends of said U-bolt;

a pair of second outside edges for said pair of second channels, said pair of second outside edges being disposed parallel to each other, each of said pair of second outside edges extending from the one of said pair of second channels associated therewith in said second predetermined direction and into abutting relationship with one of said pair of first outside edges;

a first plurality of welds formed between said pair of first outside edges and said pair of second outside edges;

a plurality of weld projections formed on at least one of said pairs of first and second outside edges, said plurality of weld projections being in abutting relationship with a preselected edge of said pairs of said first and second outside edges, said first plurality of welds between said at least one of said pairs of first and second outside edges and said preselected edge being interposed between said plurality of weld projections and said preselected edge;

a generally flat second web formed in said second preformed piece between said pair of second channels, said generally flat second web having a second inner surface facing in said second predetermined direction and abutting said first inner surface of said generally flat first web and further having a second outer surface disposed opposite said second inner surface and facing in said first predetermined direction;

a partially circular second upper edge formed in said generally flat second web of said second preformed piece, said partially circular second upper edge extending between said pair of second channels, said partially circular second upper edge being disposed adjacent to and aligned with said partially circular first upper edge of said first preformed piece, said partially circular first and second upper edges cooperating with said radiused portion of said U-bolt when said two parallel elongated ends of said U-bolt are passed through said pair of parallel box-shaped passageways to form an approximately circular region therebetween; and

a tab formed in said second preformed piece, said tab extending from said generally flat second web opposite said partially circular second upper edge, said tab being deflected about said generally linear first lower edge of said first preformed piece such as to abut said first outer surface of said generally flat first web to further secure said first and second preformed pieces together.

4,488,335

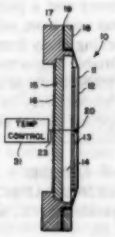
HOT MELT ADHESIVE ATTACHMENT PAD

Robert L. Fox, Hayes; Alan W. Frizzill, Newport News; Bruce D. Little, Hampton; Donald J. Progar; Robert H. Coultrip, both of Yorktown; Richard H. Couch, Mathews; John R. Gleason, Hampton; Bland A. Stein; John D. Buckley, both of Newport News, and Terry L. St. Clair, Poquoson, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 22, 1983, Ser. No. 516,087

Int. Cl.³ A44B *21/00*; B32B *15/08*

U.S. Cl. 24—304 **18 Claims**



1. A hot melt adhesive attachment pad comprising:

cloth means, said cloth means having top surface means and bottom surface means;

a charge of hot melt adhesive seletively impregnated on said top surface means of said cloth;

heating means, said heating means being oriented in close proximity to said bottom surface means in order to heat said cloth means and melt said charge of hot melt adhesive;

cooling means, said cooling means being oriented adjacent to said bottom surface means in order to cool said cloth means and solidify said charge of hot melt adhesive;

mounting means, wherein said cloth means, said heating means and said cooling means are securely held in said mounting means and said mounting means is shaped to form a head assembly; and

temperature control means for controlling the temprature of said heating and cooling means.

4,488,336

BUCKLING DEVICE

Gilbert Ambal, Frepillon, France, assignor to ITW de France, Beauchamp, France

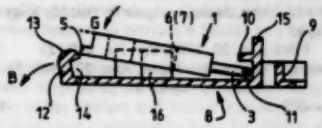
Filed Feb. 17, 1983, Ser. No. 467,405

Claims priority, application France, Feb. 26, 1982, 82 03212

Int. Cl.³ A44B *11/25*

U.S. Cl. 24—316 **5 Claims**

1. A two piece plastic buckling device of the type for use with strap or other connection means including a male and a female elements, and a complementary catch means of each of said elements, said female element comprising a base, a holding recess means and a retaining recess means on said female element adjacent said base, obstacle means on said female element base positioned between said holding recess and said retaining recess, an integral elastic spring means and a complimentary protuberance on said male element, at least one intermediate abutment on said male element positioned between said elastic spring means and said complimentary protuberance in such a way that said obstacle means of said female element contacts and cooperates with said abutment of said male element, whereby when traction forces are exerted upon said two elements said abutment and obstacle means protects said male and



female catch means consisting of said retaining recess and said complimentary protuberance, from said traction force, the removal of said abutment of said male element from behind said obstacle means of said female element being produced by compressing said spring means of said male elements in said holding recess of said female element.

4,488,337

SEPARABLE SLIDE FASTENER AND METHOD OF ATTACHING THE SAME TO KNIT FABRICS

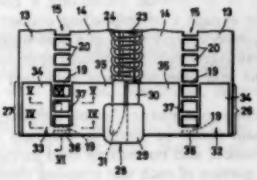
Hiroshi Yoshida, Kurobe; Yoshio Matsuda, Nyuzen, and Shunji Akashi, Kurobe, all of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Apr. 29, 1981, Ser. No. 258,647

Claims priority, application Japan, Jul. 12, 1980, 55-95240

Int. Cl.³ A44B *19/24*

U.S. Cl. 24—381 **10 Claims**



1. A separable slide fastener comprising:

(a) a pair of warp-knit stringer tapes each including a first web composed of at least one wale of chain stitches, a second web spaced transversely from said first web with a wale-free region therebetween, said second web including a wale of chain stitches extending along said wale-free region in confronting relation to said wale in said first web, said wales of chain stitches being knitted of reinforced threads, and a thread interconnecting said wales of chain stitches across said wale-free region defining permanent apertures, said thread having a plurality of transverse portions extending across said wale-free region between said first and second webs;

(b) a pair of rows of coupling elements each mounted on said second web of one of said warp-knit stringer tapes which is remote from said wale-free region;

(c) a slider movable along said pair of rows of coupling elements for engaging and disengaging the latter;

(d) a separable bottom end stop comprising a box and a box pin extending therefrom, which are mounted on one of said warp-knit stringer tapes at one end thereof, and a pin mounted on the other stringer tape at one end thereof and insertable into said box; and

(e) a flat reinforcement member mounted on each of said stringer tapes at said one end thereof and adjacent to said separable bottom end stop and including first and second portions partly covering said first and second webs, re-

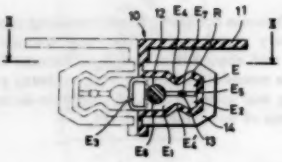
spectively, and a third portion contiguous to said first and second portions and only partly covering said wale-free region, said third portion overlying at least one of said transverse portions of said interconnecting thread.

4,488,338

SEALING SLIDE FASTENER STRINGER

Kihei Takahashi, Uozu, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Aug. 20, 1980, Ser. No. 410,129
Claims priority, application Japan, Aug. 20, 1981, 56-129439
Int. Cl.³ A44B 19/32
U.S. Cl. 24—389 1 Claim



1. A sealing slide fastener stringer comprising:

(a) a support tape made of a fluid-tight material;

(b) a series of discrete coupling elements made of metal and mounted on said support tape along a longitudinal edge portion thereof, each of said coupling elements including a base, a foot and a head portion, each said coupling element having a pair of recesses disposed between said base and foot portions;

(c) said longitudinal edge portion of said support tape being folded so as to provide therealong a contact portion adapted to engage a corresponding contact portion of a like companion stringer to effect a fluid-tightness between such two stringers, said longitudinal edge portion extending around said base portion of each said coupling element;

(d) a connecting cord made of flexible material and interconnecting said series of coupling elements in uniformly spaced relation, said connecting cord extending through said base portion of each said coupling element, portions of said cord lying between adjacent coupling elements being engageable with the head portions of a corresponding mating stringer;

(e) a series of generally U-shaped sealing strips made of metal, each strip surrounding the folded edge portion of said support tape over said base and foot portions of a respective one of said coupling elements, each said sealing strip having on its inner surface a pair of opposed projections received one in each said recess of said base portion of the respective coupling elements; and

(f) an elongated resilient connecting member interconnecting said series of sealing strips in uniformly spaced relation in registration with the pitch of said series of coupling elements.

4,488,339

BUCKLE ASSEMBLY

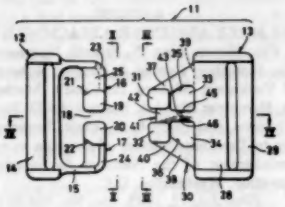
Kazumi Kasai, Namerikawa, Japan, assignor to Nippon Notion Kogyo Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1982, Ser. No. 442,635
Claims priority, application Japan, Dec. 28, 1981, 56-195556[U]
Int. Cl.³ A44B 17/00
U.S. Cl. 24—575 8 Claims

1. A buckle assembly comprising:

(a) a socket of synthetic resin including an attachment for connection to one end of a belt, and a pair of hooks extending from said attachment, said hooks having a pair of locking bodies spaced from each other by a gap, respectively, and a pair of arms integral therewith and having a pair of first recesses opening away from each other; and

(b) a plug of synthetic resin adapted to be combined with said socket and including a base, an attachment extending therefrom for connection to an opposite end of the or another belt, and a retainer extending from said base, said retainer having a pair of spaced studs and a pair of holes



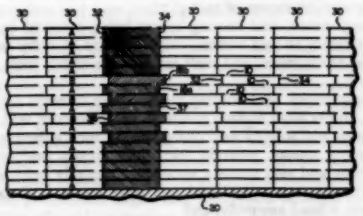
disposed between said studs and said base and defining therebetween an insert and a pair of legs extending between said studs and said base, said legs having a pair of second recesses opening away from each other, said locking bodies being fittable respectively in said holes with said arms received respectively in said second recesses and said legs received respectively in said first recesses and with said insert disposed in said gap.

4,488,340

APPARATUS FOR MAKING CAPACITIVE STRUCTURES

Charles C. Rayburn, Lynchburg, Va., assignor to Illinois Tool Works Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 238,717, Feb. 27, 1981, abandoned. This application Mar. 15, 1983, Ser. No. 475,568
Int. Cl.³ H01G 4/32
U.S. Cl. 29—25.42 17 Claims



1. Apparatus for making capacitive structures comprising a plurality of supply spindles; a plurality of sets of support rollers, each set of support rollers being associated with a supply spindle; and at least one rotatable drum; each of said supply spindles being appropriately proportioned and positioned with respect to said at least one drum to accommodate rotatable mounting of a supply roll of web material in a position and manner whereby each of said respective associated sets of support rollers supports and guides its respective web from said respective supply roll to said at least one drum, said web material having a dielectric substrate with a metallic film upon one side of said substrate; said apparatus further comprising means for slitting said webs into ribbons prior to winding said ribbons upon said at least one drum to provide alternate layers of metallic and dielectric material; said respective sets of support rollers each being positioned with respect to said at least one drum and said means for slitting webs to support said ribbons over substantially their full length prior to winding upon said at least one drum; all of said supply spindles, said sets of support rollers, said means for slitting webs, and said at least

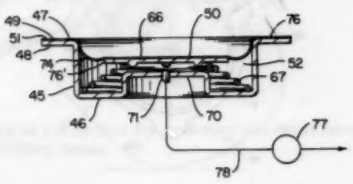
one drum being aligned so that said ribbons are wound upon said at least one drum to form a plurality of adjacent interleaved rings of capacitive structure.

4,488,341

METHOD OF MAKING A FLUID PRESSURE ACTUATOR

Douglas R. Scott; Frank Payne, and Roscoe M. Allor, all of Knoxville, Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 16, 1982, Ser. No. 408,150
Int. Cl.³ B23P *15/00*
U.S. Cl. 29—156.4 R **11 Claims**



1. In a method of making a fluid pressure actuator construction comprising the steps of forming a housing means with an annular surface means, securing an outer peripheral portion of a flexible diaphragm to said annular surface means to define a fluid chamber with said housing means whreby certain pressure differentials acting across said diaphragm cause movement thereof relative to said housing means for actuation purposes or the like, and before said step of securing said diaphragm disposing a compression spring in said chamber to act between said housing means and said diaphragm to tend to move said diaphragm in a direction away from said chamber, disposing a backup plate in said chamber so as to engage against said side of said diaphragm that faces said chamber, causing said spring to have one end thereof bearing against said backup plate, and forming said diaphragm to comprise a lamination having a polymeric layer defining the side thereof facing away from said chamber and a metallic layer defining the side thereof facing said chamber, the improvement comprising the step of forming said diaphragm with an annular convolution adjacent said annular surface means and inboard thereof by drawing said convolution in said diaphragm with a pressure differential created across said diaphragm after said diaphragm has been secured to said housing means so as to have a convex side thereof facing said chamber.

4,488,342

VESSEL CONSTRUCTION EMPLOYING MULTIPLE INTERNAL HEAT EXCHANGE TUBES

Paul G. Daugirda, Evergreen Park, Ill., assignor to Rheem Manufacturing Company, New York, N.Y.

Division of Ser. No. 116,272, Jan. 28, 1980, abandoned, and a continuation of Ser. No. 280,447, Jul. 6, 1981, Pat. No. 4,415,020. This application Jun. 18, 1982, Ser. No. 389,591
Int. Cl.³ B23P *15/26*; F28F *9/16*
U.S. Cl. 29—157.3 R **2 Claims**

1. A method of manufacture of a water heater tank of the type including a tank body, heat exchange tubes positioned in the body and headers attached to the opposite ends of the tubes to enclose a volume within the body, comprising the steps of:

(a) forming first and second opposed headers of identical shape and a separate, uniform constant transverse dimension, the first one of the headers defining a uniform constant transverse dimension smaller than the transverse dimension of the second header;

(b) metallurgically affixing a plurality of tubes through the opposed headers to provide a header and tube subassembly;

(c) forming a tubular body having a uniform cross sectional interior shape along the length of the body identical to the shape of the headers and further forming the body with two transverse dimension regions, for slidable and adjustable receipt of the headers, with one region of the body being formed with a uniform, constant transverse dimension to slidably receive the first, smaller header only and the other region of the body being formed with a uniform, constant transverse dimension to slidably receive the second header;

(d) coating the portion of the header and tube subassembly that forms the interior of water heater tank with a protective material;

(e) initially inserting the first header and tube subassembly into the larger end of the tubular body and then slidably positioning said subassembly with the first, smaller header received and circumferentially retained by the smaller dimension portion of the body and the other, second header received and circumferentially retained by the other relatively larger dimensioned portion of the body; and

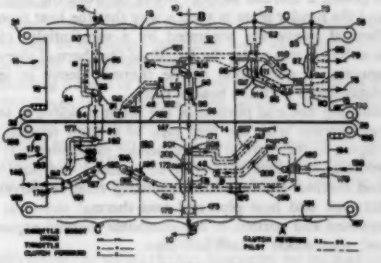
(f) metallurgically affixing the headers to the body to form an enclosed tank.

4,488,343

MOUNTING ASSEMBLY FOR FLUID ACTUATED COMPONENTS AND METHOD FOR CONNECTING SAID COMPONENTS THERETO

Jacob Kobelt, 6110 Oak St., Vancouver, British Columbia, Canada V6M 2W2

Filed May 7, 1982, Ser. No. 378,437
Int. Cl.³ B21D *53/00*; B21K *29/00*; B23P *15/26*
U.S. Cl. 29—157.1 R **13 Claims**



1. A mounting assembly for coupling together a plurality of fluid actuated components utilizing a pressurized fluid, each component having a mounting base with ports to receive and to discharge fluid and being adapted to be secured to the mounting assembly with fasteners, the mounting assembly including:

(a) a mounting plate having a main face with a first face recess separated from an adjacent second face recess by a partition, the recesses being within the face and having open outer portions and closed inner portions, a portion of the partition being adapted to be removed to provide communication between the first and second face recesses, the mounting plate having edge portions with edge faces

disposed generally perpendicularly to the main face and containing input and output connection recesses adapted to receive and to discharge fluid respectively and to communicate with the face recesses as required, the connection recesses having central axes within a plane disposed parallel to the main face of the plate, the plate also having fastener openings to receive the fasteners for securing the components to the assembly,

an intermediate plate adapted to fit between the components and the mounting plate and to be secured and sealed thereto so as to seal the open outer portions of the face recesses to form passages through the mouting assembly, the intermediate plate being relatively thin and having communication openings therein adapted to register with the ports of the components and to communicate with particular adjacent face recesses within the mounting plate as required, and clearance openings to accept the fasteners.

4,488,344

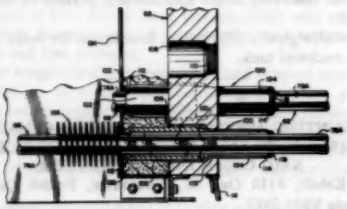
WASTE HEAT RECOVERY SYSTEM HAVING THERMAL SLEEVE SUPPORT FOR HEAT PIPE

Jack McCurley, Dallas, Tex., assignor to Q-dot Corporation, Garland, Tex.

Division of Ser. No. 165,059, Jul. 1, 1980, Pat. No. 4,426,959. This application Mar. 4, 1982, Ser. No. 354,746

Int. Cl.³ B23P *15/00*

U.S. Cl. 29—157.4 **3 Claims**



1. A method for supporting a heat pipe in a heat pipe opening in a header plate comprising the steps of:

interposing a thermal support sleeve between the heat pipe and the header plate in such a way that the heat pipe and thermal sleeve are separated by a substantially closed annular air gap along the length of the thermal sleeve;

connecting a midsection of the thermal sleeve in sealed engagement with the header plate;

connecting one end portion of the thermal sleeve in sealed engagement with the heat pipe at a point remote with respect to the thermal sleeve/header plate interface; and

supporting said heat pipe with an opposed end portion of said thermal sleeve while permitting relative movement between said heat pipe and said thermal sleeve at said opposed end portion to accommodate thermal expansion and contraction of said heat pipe.

4,488,345

METHOD AND APPARATUS FOR ASSEMBLING A WATCH CASE HAVING IMPROVED STRUCTURE FOR INSTALLING A BATTERY CELL

Jacques Müller, Reconvilier, and Elmar Mock, Bienne, both of Switzerland, assignors to ETA S.A., Fabriques d'Ebauches, Granges, Switzerland

Filed Jun. 24, 1982, Ser. No. 391,739

Claims priority, application Switzerland, Jun. 24, 1981, 4166/81

Int. Cl.³ B23P *13/00*

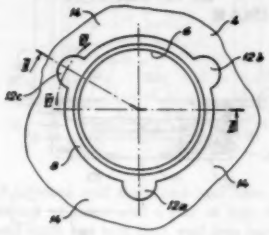
U.S. Cl. 29—177 **13 Claims**

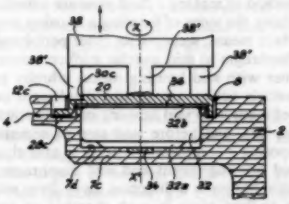
1. A method of installing a battery cell in an outwardly opening cavity provided in a watch case made of thermoplastic material, comprising the steps of:

providing a closure having a plurality of radially extending lugs, said closure being sized to close said cavity;

providing around the opening of said cavity a corresponding plurality of radially extended, circumferentially spaced, outwardly opening recesses sized to receive said lugs when said closure is placed in said opening;

positioning a cell in said cavity;





positioning said closure at said opening with said lugs extending into said recesses;

rotating said closure while applying energy to said lugs; and

causing each of said lugs to engage a side wall of its respective recess, whereby said thermoplastic material softens sufficiently to permit said lugs at least partly to enter the portions of said watch case between said recesses as said closure is rotated, to form undercuts in which said lugs remain when said rotating ceases, thereby ensuring the secure installation of said closure.

4,488,346

APPARATUS FOR JOINING PIPE

Lee A. Archer, Asheville, N.C., assignor to Akzona Incorporated, Enka, N.C.

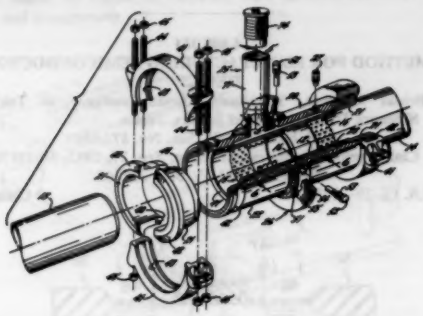
Filed Jun. 22, 1981, Ser. No. 276,134

Int. Cl.³ B23P *17/00*

U.S. Cl. 29—421 E **5 Claims**

1. An apparatus for splicing pipe by sealing a sleeve over the ends of adjacent pipe lengths comprising, in combination, a chamber for completely confining a substantially incompressible medium about said sleeve, said chamber including a pair of annular end members sized to closely surround said pipe lengths and abut the ends of a sleeve fitted over the ends of adjacent pipe lengths, said chamber also including a cylindrical body sealed between the end members and defining an annular cavity surrounding said sleeve, holding means mounted in said body for radial movement to firmly engage said sleeve inter-

mediate of its ends so as to hold its circularity, means for firing a propellant into said chamber, and an actuator responsive to



said firing of a propellant for producing said radial movement of said holding means.

4,488,347

METHOD OF AND APPARATUS FOR ARRANGING HELICAL COILS IN INTERDIGITATED SIDE-BY-SIDE DISPOSITION

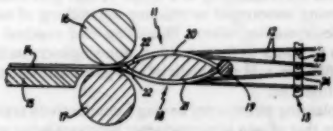
Gerrit W. E. Leuvelink, Haaksbergen, Netherlands, assignor to Textiel Techniek Haaksbergen B.V., Haaksbergen, Netherlands

Filed Jul. 8, 1981, Ser. No. 281,384

Claims priority, application United Kingdom, Jul. 12, 1980, 8022869

Int. Cl.³ B23P *19/04, 11/02, 19/02, 21/00*

U.S. Cl. 29—433 **21 Claims**



1. A method of bringing together continuous lengths of flexible, closely-wound helical coils of opposite hand into interdigitated side-by-side relationship to form a coil structure comprising:

providing a guide for continuously receiving the coils to be joined and for arranging such coils in superimposed, and in laterally overlapping disposition;

providing a convex support surface for contact by any two adjacent coils;

drawing the coils continuously along said guide to arrange the coils in superimposed laterally overlapping disposition;

separating the successive turns of at least one of any two adjacent overlapped coils by moving the same over and in contact with a substantial portion of said support surface by said drawing step thus to facilitate subsequent interdigitation of said coils; and

causing said superimposed, laterally overlapped coils of which the successive turns of at least one of any two adjacent coils are separated to move into contact with a constraint along a path defined by said support surface, thereby to cause the coils to move together into interdigitated relationship.

5. The method of bringing together coil structures each comprising a pair of coils of opposite hand arranged in interdigitated disposition comprising the steps of arranging adjacent such structures with a coil of a given hand of one pair in laterally overlapping disposition relative to a coil of opposite hand of the adjacent pair, and drawing the respective overlapped coil structures to converge to and through a common throat thereat to move into mutual engagement, wherein at least one of said overlapped structures is drawn to follow a non-linear path defined by a convex surface in moving into the throat, thereby slightly to separate the successive turns of the coil of the pair intended for interdigitation with the coil of opposite hand of the adjacent pair to facilitate such interdigitation.

4,488,348

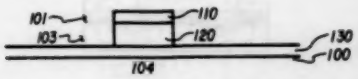
METHOD FOR MAKING A SELF-ALIGNED VERTICALLY STACKED GATE MOS DEVICE

Richard D. Jolly, Aloha, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 15, 1983, Ser. No. 504,632

Int. Cl.³ H01L *21/90, 23/52*

U.S. Cl. 29—571 **5 Claims**



1. A method for producing a semiconductor structure on a substrate having doping of a first type, comprising the steps of:

forming a first intermediate insulating layer over a portion of the surface of a semiconductor substrate;

forming a second layer of a first semiconductor material having doping of a second type over selected portions of said first intermediate insulating layer;

forming first and second implant regions of dopant of the second type in selected regions of the substrate other than regions overlain by said second layer;

forming a third layer of a second intermediate insulating material containing dopant of a first type at least over lateral surfaces of said second layer;

forming a fourth layer of said first intermediate insulating layer over a selected portion of said second layer of semiconductor material;

forming a fifth layer of semiconductor material having doping of the second type over said first, third and fourth intermediate insulating layers;

diffusing dopant of the first type from said third layer of second intermediate insulating layer to a selected boundary limit in said fifth layer;

depositing dopant of the first type in selected regions of said fifth layer to within a selected lateral distance from said selected boundary limit of said second layer; and

diffusing said dopant of the first type deposited in selected regions of said fifth layer until said first type dopant material meets said selected boundary limit in said fifth layer.

4,488,349

METHOD OF REPAIRING SHORTS IN PARALLEL CONNECTED VERTICAL SEMICONDUCTOR DEVICES BY SELECTIVE ANODIZATION

Koichi Murakami, and Teruyoshi Mihara, both of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Mar. 15, 1983, Ser. No. 475,403

Claims priority, application Japan, Apr. 9, 1982, 57-59155; Apr. 10, 1982, 57-59940

Int. Cl.³ H01L *21/76, 21/00;* **B05D** *5/12*

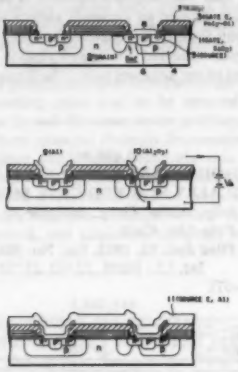
U.S. Cl. 29—575 **12 Claims**

1. A method of repairing shorts in parallel connected vertical semiconductor devices by selective anodization, which comprises the steps of:

(a) forming electrode regions on a substrate by etching an insulating film formed on the substrate;

(b) anodizing the electrode regions with the substrate as an anode; and

(c) forming a common electrode on the electrode regions,



whereby only defective electrode regions are anodized into silicon oxide for insulating the defective electrode regions from the common electrode.

4,488,350

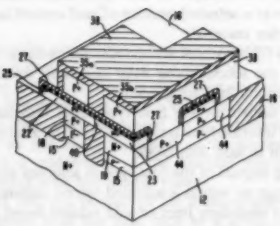
METHOD OF MAKING AN INTEGRATED CIRCUIT BIPOLAR MEMORY CELL

Madhukar B. Vora, Los Gatos, and William H. Herndon, Sunnyvale, both of Calif., assignors to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed Oct. 27, 1981, Ser. No. 315,678

Int. Cl.³ H01L *21/225*

U.S. Cl. 29—577 C **24 Claims**



1. A method of fabricating a semiconductor structure comprising:

forming a first layer of semiconductor material on a semiconductor body, a first portion of the first layer being first conductivity type, and a second portion of the first layer being opposite conductivity type;

performing in a predetermined order the steps of:

forming a layer of electrically conductive material over the first portion and all but a selected part of the second portion of the first layer of semiconductor material;

removing all but selected portions of the layer of electrically conductive material and the underlying first layer of semiconductor material to thereby define a first pair of strips on the semiconductor body;

providing a layer of electrically insulating material over all of the layer of electrically conductive material;

depositing a first region of a second layer of semiconductor material of first conductivity type in contact with the selected part of the second portion of the first layer; and

causing some of the first conductivity type impurity and some of the opposite conductivity type impurity in the first layer of semiconductor material to diffuse into the semiconductor body.

4,488,351

METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICE

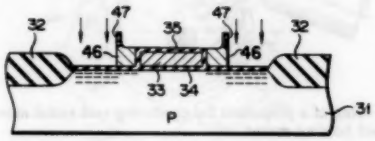
Hiroshi Momose, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jan. 25, 1984, Ser. No. 573,654

Claims priority, application Japan, Jan. 27, 1983, 58-11970

Int. Cl.³ H01L *21/308, 21/265*

U.S. Cl. 29—578 **9 Claims**



1. A method for manufacturing a semiconductor device, comprising the steps of:

forming a gate electrode on a surface of a gate oxide film on a semiconductor substrate;

forming a first film on surfaces of said gate electrode and said semiconductor substrate;

forming a non-single-crystalline silicon film to cover an entire surface;

forming a second film to cover an entire surface;

performing anisotropic or reactive ion etching of said second film to form residual second films on side walls of that step portion non-single-crystalline silicon film which is formed corresponding to a shape of said gate electrode;

performing anisotropic or reactive ion etching of said non-single-crystalline silicon film using said residual second films as masks to form residual non-single-crystalline silicon films on said side walls of said gate electrode through said first film;

ion-implanting an impurity having a conductivity type opposite to that of said semiconductor substrate using as masks said gate electrode and said residual non-single-crystalline silicon films;

removing said residual non-single-crystalline silicon films; and

annealing a resultant structure to activate the impurity so as to form source and drain regions each of which comprises an impurity region of a high impurity concentration and an impurity region of a low impurity concentration which is adjacent to said impurity region of high impurity concentration and which is located under a structure area corresponding to one of said residual non-single-crystalline silicon films which have been removed.

4,488,352

APPARATUS FOR ASSEMBLING CIRCUIT COMPONENTS WITH A PRINTED CIRCUIT BOARD

Angel M. Velazquez; Eduardo N. Vivas, and Joe Rios, all of Mayaguez, P.R., assignors to Commonwealth of Puerto Rico, San Juan, P.R.

Filed Apr. 18, 1983, Ser. No. 485,854

Int. Cl.³ H05K *3/30*

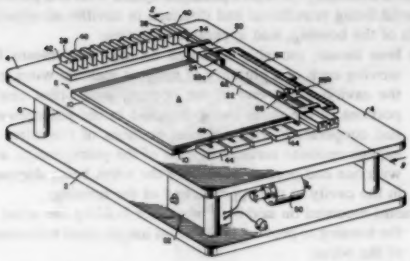
U.S. Cl. 29—741 **10 Claims**

1. Apparatus for moving electrical circuit components into engagement with an integrated circuit board, comprising:

(a) means for supporting a circuit board in horizontal position and holding it from movement,

(b) means for supporting a plurality of components in elongated longitudinal side-by-side relation above the board,

(c) releasable means for holding the components from movement toward the board,
(d) means for imparting vibratory movement to the board and components,



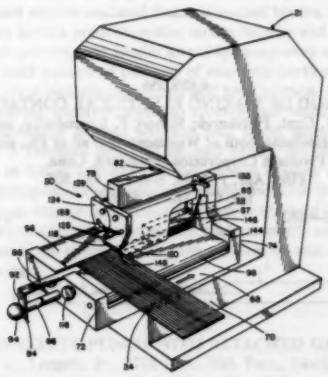
(e) means operable upon release of the releasable means for moving the components into engagement with the board, and
(f) means for connecting each component to the board.

4,488,353

TERMINATION TOOLING FOR APPLYING CONNECTORS TO FLAT CABLE

Jack E. Caveney, Hinsdale, and Roy A. Moody, Flossmoor, both of Ill., assignors to Panduit Corp., Tinley Park, Ill.

Filed Feb. 4, 1983, Ser. No. 464,075
Int. Cl.[3] H01R *43/04*
U.S. Cl. 29—749 **21 Claims**



1. Wire movement apparatus adapted for use with tooling for terminating wires in insulation displacement mass termination connectors having metallic terminal elements, said tooling comprising:

holding means for positioning a connector;

a termination die; and

prime mover means connected to cause said die and said holding means to undergo reciprocal movement relative to one another to effect concurrent termination of a plurality of insulated conductors in said connector, said wire movement apparatus comprising:

a wire stop disposed adjacent one side of said holding means for abutting the leading ends of said wires; and

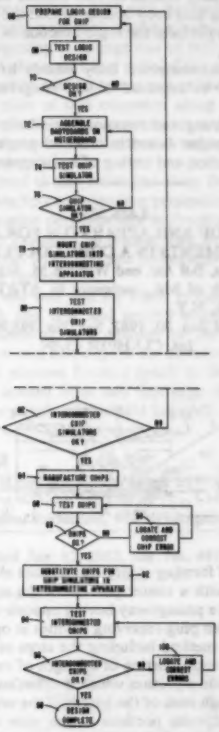
wire movement means to move said wires in their axial direction a predetermined distance from their position in which they engaged said stop toward said terminal elements prior to wire termination.

4,488,354

METHOD FOR SIMULATING AND TESTING AN INTEGRATED CIRCUIT CHIP

Kasun K. Chan, Del Mar; Gerald J. Erickson, San Diego; David B. Schuck, and James W. Stone, both of Escondido, all of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Nov. 16, 1981, Ser. No. 321,370
Int. Cl.[3] H05K *3/36*; G01R *3/00*; H01K *1/12*
U.S. Cl. 29—830 **10 Claims**



1. In a method for testing a system that includes a plurality of interconnected integrated circuit chips, a process for simulating said chips in order to test the circuit design for said system prior to the manufacture of said chips, said process for simulating comprising:

A. providing a plurality of chip simulators, each of said chip simulators comprising:

a. a mother circuit board; and

b. a plurality of baby circuit boards each including circuit components interconnected thereon for performing the function of a portion of the circuitry to be on one of said circuit chips, said baby circuit boards being interconnected on said mother circuit board so that together they will perform the function of said one of said circuit chips;

B. interconnecting said chip simulators, so that the interconnected chip simulators will perform the function of said integrated circuit chips in said system; and

C. testing the interconnected chip simulators to determine errors in the circuit design of said system

D. then disconnecting and removing said baby circuit boards from said mother board for one or more of said chip

simulators in order to prepare for a subsequent simulation of circuit chips.

8. A method for simulating and testing the operation of circuitry on an integrated circuit chip, wherein the circuit chip includes a plurality of circuit cells, where said method comprises:

providing a baby board for each of said circuit cells, each baby board having mounted thereon circuit components performing the logic function of one of said circuit cells;

providing a mother board;

mounting the baby boards on said mother board;

interconnecting said baby boards so that the interconnected baby boards perform the logic function of said integrated circuit chip;

testing the interconnected baby boards to determine the operation to be expected of said integrated circuit chip; and

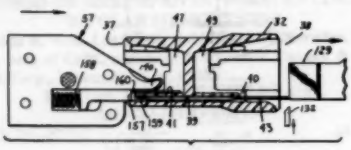
then disconnecting and removing said baby circuit boards from said mother board in order to prepare for a subsequent simulation and testing of an integrated circuit chip.

4,488,355

METHODS OF AND APPARATUS FOR FORMING CONTACT ELEMENTS IN A CORD COUPLER HOUSING

Erie M. Hutchins, Bel Air, and William M. Schoenemann, Jr., Baltimore, both of Md., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed Jun. 30, 1982, Ser. No. 393,991
Int. Cl.³ H01R *43/04*
U.S. Cl. 29—882 **25 Claims**



1. A method of forming a wire-like contact element within a plastic housing with a center portion of the contact element being disposed in a passageway having opposie surfaces which communicates with plug-receiving cavities at opposite ends of the housing, said method including the steps of:

preforming a center portion of a length of resilient metallic wire to include a portion which is offset sufficiently from an axis through ends of the length of the wire to cause the offset and adjacent portions of the wire to engage said opposite surfaces of the passageway in which the center portion of the wire is to be disposed;

moving the length of wire into the housing to cause a first end portion of the wire to be disposed in the cavity at one end of the housing and a second end portion of the wire in the cavity at the opposite end of the housing, and to cause the center portion of the wire to be disposed in the passageway with the offset portion of the wire being positioned adjacent to the portion of the wall of the passageway opposite the wall adjacent to the associated cavities in the housing;

applying lateral support to a portion of the wire contained in the passageway between the first end portion of the wire and the offset portion of the wire and adjacent to the offset portion of the wire to hold that portion of the wire, against which support is provided in engagement with the wall of the passageway adjacent to the one cavity at the one end of the housing while the one end of the wire is being bent into a retroflexed configuration;

causing the first and second end portions of the length of wire to be formed into a retroflexed configuration by applying forces in a controlled manner to the length of wire between its offset portion and its ends, the application of forces in a controlled manner being effective to allow the end portions of the resilient wire to move pivotally into predetermined neutral positions when the application of forces is discontinued.

23. An apparatus for forming a plurality of wire-like metallic contact elements within a plastic housing with a center portion of each extending through a passageway and with end portions of each being retroflexed and disposed in cavities at opposite ends of the housing, said apparatus including:

a base means; movably mounted on said base means for moving each of a plurality of resilient metallic wires into the cavity at one end of the housing with offset center portions of the wires being disposed in the passageways and cooperating with adjacent portions of the wires to engage opposite surfaces of each of the passageways, and with one end portion of each of the wires being disposed in the cavity at the opposite end of the housing;

means mounted on said base means for holding the wires in the housing to prevent inadvertent longitudinal movement of the wires;

tool means mounted on said base means for applying forces to one end portion of each wire in the cavity at the opposite end of the housing while the wires are held against longitudinal movement by the means for preventing longitudinal movement of the wires by the tool means to cause the one end portions of the wires to assume retroflexed configurations; and

means mounted on said base means for applying lateral support on portions of each wire between its offset portion and its one end portion contained within the adjacent ends of the passageways in a controlled manner such that when said tool means is disengaged from the wires the one end portion of each of the wires is moved pivotally to a predetermined neutral retroflexed configuration.

4,488,356

METHOD OF MAKING ELECTRICAL CONTACTS

Edward W. Gust, Pittsburgh; Robert F. Levendosky, and William A. Hochella, both of Westmoreland, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Apr. 1, 1983, Ser. No. 481,505
Int. Cl.³ H01R *43/04*
U.S. Cl. 29—882 **6 Claims**

1. The method of making electrical contact buttons comprising the steps of:

presenting a strip of clad metal having a width narrower than the diameter of a finished electrical contact button and having a thickness greater than the thickness of said finished electrical contact button to a coining operation;

successively pressing the strip of clad metal in the coining operation between a coining punch and a coining die to successively plastically deform uniformly spaced apart portions of the strip into the configuration of the electrical contact button;

successively pressing a rib shaped die into the strip in the spaces between contact buttons to form a transverse rib in the strip which is capable of checking forward flow of the clad metal during the preceding pressing step wherein the clad metal is plastically deformed into the configuration of the electrical contact button;

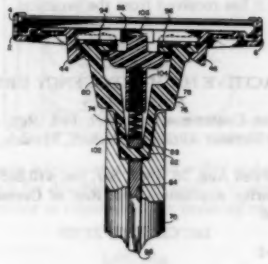
and punching the electrical contact buttons out of the strip.

4,488,357

SAFETY RAZOR

Chester F. Jacobson, Southboro, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Sep. 17, 1982, Ser. No. 419,186
Int. Cl.³ B26B 21/06
U.S. Cl. 30—57 2 Claims



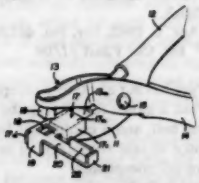
1. A safety razor including a blade assembly and a handle assembly, said blade assembly comprising a body portion of molded plastic, first and second blades mounted on said body portion between skin engaging elements adapted in operation to engage a surface being shaved ahead and behind, respectively, of said blades, said blades each being independently movable relative to said elements in response to forces encountered during a shaving operation, one of said skin-engaging elements comprising a guard portion independently movable during said shaving operation, spring finger biasing means integral with said body portion and exercising a bias against said guard portion and said first and second blades, said blade assembly having pivot mounting means thereon and an underside cam portion, said handle assembly comprising a grip portion, a head portion at one end of said grip portion, complemental pivot mounting means on said head portion comprising shell bearing means adapted to receive said blade assembly pivot mounting means, whereby said blade assembly, as a whole, is pivotally movable on said handle assembly in response to forces encountered during said shaving operation, and a spring-biased plunger reciprocally movable in said head portion to engage said underside cam portion of said blade assembly to exercise a bias on said blade assembly and thereby urge said blade assembly to a given position on said shell bearing means.

4,488,358

DISKETTE PUNCH WITH ATTACHED GAGE

Archie L. Leggett, Jr., 4211 NW. 75th Terr., Lauderhill, Fla. 33319

Filed May 2, 1983, Ser. No. 490,330
Int. Cl.³ B26F 1/32
U.S. Cl. 30—363 3 Claims



1. In a punch for use on a magnetic record diskette jacket which has substantially flat opposite major faces and adjoining first and second straight edges extending between said faces perpendicular to each other, said punch having:

opposed first and second jaws which are movable toward and away from each other;

and a punch element on said first jaw projecting toward said second jaw;

the improvement which comprises a gage attached to said second jaw and presenting:

a flat wall formed with an opening positioned to receive said punch element when said first and second jaws are brought together;

a flat extension coplanar with said flat wall and located on one side of said jaws, said extension being elongated away from said opening to engage one of said faces of the diskette jacket elong said first edge of the jacket:

a side lip joined to said extension and extending perpendicular to the plate of said extension along the direction of elongation of said extension to engage said first edge of the diskette jacket when said extension engages said one face of the diskette jacket:

an end lip joined to said extension away from said opening past said side lip and extending perpendicular to the plate of said extension perpendicular to the direction of elongation of said extension to engage said second edge of the diskette jacket when said side lip engages said first edge of the diskette jacket;

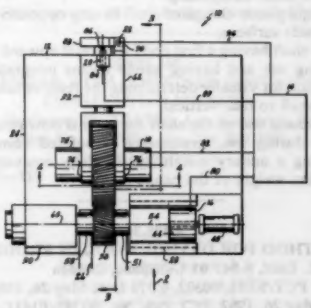
said side lip and said end lip when in engagement respectively with said first and second edges of the diskette jacket positioning said opening in the gage extending inward from said first edge of the diskette jacket, whereby said punch element forms a notch in the diskette jacket extending inward from said first edge thereof when the jaws of the punch are brought together.

4,488,359

AUTOMATIC GEAR CHECKING STRUCTURE AND METHOD

Donald A. Misson, Richmond, Mich., assignor to Lear Siegler, Inc., Del.

Filed Jan. 12, 1983, Ser. No. 457,498
Int. Cl.³ G01B 7/28
U.S. Cl. 33—179.5 C 23 Claims



10. Structure for automatically gaging gears comprising means for supporting a master gear for rotation about the axis of generation thereof and for permitting biased movement of the master gear in one radial direction and for permitting biased angular movement of the master gear on the axis of generation thereof, means positioned adjacent the means for supporting the master gear for feeding a work gear into engagement with the rotatably supported master gear, means operably associated with the means for feeding a work gear into engagement with the master gear for rotatably supporting the work gear in tight mesh with the master gear for at least one full revolution of the work gear means operably associated

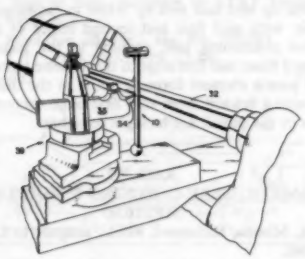
with the means for rotatably supporting the work gear for directing the work gear away from the master gear, means for separately sensing the angular position of rotation of the master gear operably associated with the master gear, the angular position of rotation of the work gear operably associated with the work gear, the center to center distance between the master gear and work gear operably associated with the master gear and the angular rotation of the axis of generation of the master gear operably associated with the master gear, with the master gear and work gear in tight mesh and means connected to the means for sensing the angular position of the gears, the center to center distance between gears and the angular rotation of the axis of generation of the master gear for determining deviations in the shape of the work gear in accordance therewith and for providing control signals in accordance with the deviation of the shape of the work gear from a desired shape thereof.

4,488,360

LATHE TOOL ALIGNING INSTRUMENT AND METHOD FOR ITS USE

Harry J. Steighner, 286 Three Degree Rd., Butler, Pa. 16001

Filed Mar. 22, 1984, Ser. No. 592,386
Int. Cl.³ G01B 13/19
U.S. Cl. 33—185 R 8 Claims



1. An instrument for aligning a carriage-mounted work-performing tool with the longitudinal axis of a cylindrical work piece on a lathe, comprising:

(a) a rigid planar elongated shaft having oppositely disposed flat side surfaces,

(b) the shaft having a first end for normal upward projection during use and having gauge means integrally secured thereon for visually determining the relative orientation of the shaft to true vertical,

(c) a second end of the shaft for normal downward projection during use, terminating in a fixed counterweight having a unitary weight substantially equivalent to the unitary weight of the gauge means.

4,488,361

METHOD FOR DRYING WOODEN PRODUCTS

Nils O. T. Lööf, S-547 01 Gullspång, Sweden

PCT No. PCT/SE81/00303, § 371 Date May 26, 1982, § 102(e) Date May 26, 1982, PCT Pub. No. WO82/01411, PCT Pub. Date Apr. 29, 1982
PCT Filed Oct. 15, 1981, Ser. No. 395,046
Claims priority, application Sweden, Oct. 15, 1980, 8007239
Int. Cl.³ F26B 3/34
U.S. Cl. 34—1 7 Claims

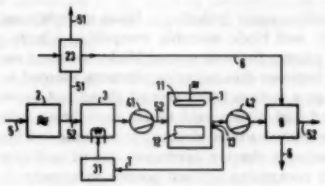
1. A method for drying wooden products, comprising the steps of: discontinuously introducing a batch of said wooden products into a closed chamber, the walls of which are impermeable to microwave energy; generating inside the chamber electrical microwave energy fields throughout said chamber completely surrounding said wooden products, continuously recirculating the same air within said chamber; and controlling the temperature and moisture content of the recirculated air in the chamber, by initially keeping the moisture content at a high level and reducing it when, in response to heat generation inside the products caused by the microwave energy, migration of moisture from the interior of the products towards their external surfaces has been initiated, and by keeping the air temperature at a value slightly below the temperature of said surface, and allowing it successively to rise in pace with the rising of the surface temperature, and removing from the air the moisture it has received from the products.

4,488,362

CAPACITIVE HIGH-FREQUENCY DRYING APPARATUS

Hans-Christian Grassmann, Igelsdorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 20, 1982, Ser. No. 410,065
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1981, 3138706
Int. Cl.³ F26B 23/08
U.S. Cl. 34—1 5 Claims



1. A capacitive high-frequency drying apparatus for drying moisture-containing material, comprising a high frequency generator, a drying oven in which electrodes of the high-frequency generator asre disposed, a heating device for heating air, means for preheating air to be further heated by the heating device from heat produced by the high-frequency generator, means for conducting the preheated air to the heating device, means for conducting the heated air from the heating device to the oven, a heat exchanger, means for conducting air and water vapor from the oven to said heat exchanger, means for passing a liquid through said heat exchanger, means for preheating said liquid by the waste heat of the high-frequency generator, and means for controlling the heating device such that the temperature of the heated air falls below the condensation temperature of vapor carried with the heated air from the oven only after entering said heat exchanger.

4,488,363

COMBINATION IDLER AND BELT FAILURE SWITCH FOR A DRYER

William A. Jackson, Hartford Township, Van Buren County, and Gerald L. Kretchman, St. Joseph Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

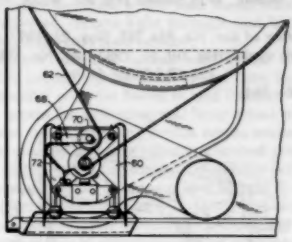
Filed Apr. 6, 1983, Ser. No. 482,522
Int. Cl.³ F26B 11/04
U.S. Cl. 34—55 11 Claims

1. In a clothes dryer having a rotating receptacle for receiving clothes to be dried, a motor for driving the receptacle, said motor having an end bell, and a continuous belt for drivingly connecting said motor to said receptacle, a combination idler and broken belt shut-off comprising:

a motor centrifugal switch, said centrifugal switch actuated to maintain operation of the motor when the motor operates above a given speed of rotation;

a spring biased idler bracket mounted on said end bell;

an idler pulley supported and biased by said bracket to maintain tension on said belt; and



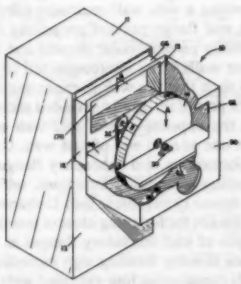
linkage means interconnecting said pulley and said centrifugal switch for deactuating said switch to cease operation of said motor in response to the breaking of said belt.

4,488,364

MODULAR APPARATUS FOR LAUNDRY DRYER HEAT RECOVERY

Ben B. Herschel, 242-B Laurel Pl., Howell, N.J. 07731

Filed Aug. 23, 1982, Ser. No. 410,448
Int. Cl.³ F26B *11/04*
U.S. Cl. 34—86 **7 Claims**



1. Energy recirculating apparatus adapted for coupling to a clothes dryer comprising:

a housing having a plurality of chambers, a first chamber arranged to receive input air and a second chamber arranged for exhausting output air;

a rotor having a hub, a rim and spaced first and second substantially parallel surfaces joining said hub and rim;

said rotor being interposed between said first and second chambered regions for transferring energy from said exhaust air to said input air;

a plurality of rods radially disposed within said rotor and arranged such that alternate ones of said rods have first ends disposed about said rim substantially equidistant from said first and second surfaces, and second ends disposed about said hub, offset towards said first surface of said rotor, others of said rods being arranged with first ends disposed about said rim substantially equidistant from said first and second surfaces and second ends disposed about said hub, offset towards said second surface of said rotor;

means for rotating said rotor;

annular means coupled to said housing and disposed in close proximity to said rim of said rotor for creating a uniform close space between said housing and said rotor;

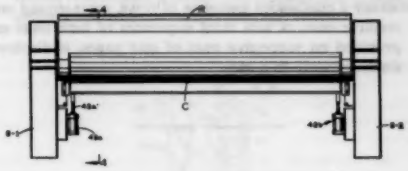
resilient means interposed between said annular means and said rotor for preventing air from passing in the space beteween said housing and said rotor.

4,488,365

HYDRAULIC SYSTEM FOR LAUNDRY FLATWORK IRONER

Charles F. Hord, and William W. Allen, both of Plantation, Fla., assignors to Jensen Corporation, Fort Lauderdale, Fla.

Filed Dec. 6, 1982, Ser. No. 446,982
Int. Cl.³ D06F *65/06*
U.S. Cl. 38—47 **10 Claims**



1. In a drive system for a laundry flatwork ironer having a plurality of rollers for ironing the flatwork and advancing it through the ironer, the combination of:

a hydraulic motor for driving the rollers;

a pump for supplying pressurized fluid to the motor to drive the motor;

means providing a low pressure passageway for fluid discharged by said hydraulic motor;

motor supply and return valve means operatively connect to said motor to control the flow of fluid from said pump to said motor and from said motor to said return passageway;

and selectively operable control valve means operatively connected hydraulically to cause said motor supply and return valve means either (a) to block fluid flow to and from said hydraulic motor or (b) to establish fluid flow from said pump to said motor and from said motor to said return passageway;

said selectively operable control valve means comprising:

a valve operatively connected hydraulically to said motor supply and return valve means to control the opening and closing of the latter;

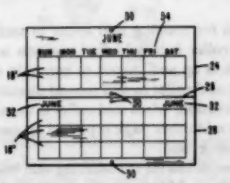
and a pump pressure control valve operatively connected hydraulically to said pump for establishing either (a) a low output pressure of the pump for operating the hydraulic motor at low speed or (b) a higher output pressure of the pump for operating the hydraulic motor at higher speed.

4,488,366

CALENDAR WITH COMBINED DISPLAY OF CONSECUTIVE MONTHS

Richard P. Hockensmith, 7014 97th Ave., Seabrook, Md. 20801

Filed Sep. 12, 1983, Ser. No. 531,288
Int. Cl.³ G09D *3/04*
U.S. Cl. 40—119 **21 Claims**



1. In a calendar having a plurality of separate pages representing particular time periods, hingedly arranged in a first sequence, each page having a plurality of rows arranged in a second sequence, each row identifying a third sequence of indicia representing specified time units, the improvement comprising:

means for simultaneously exposing at least a last portion of the second sequence of rows on one page of the calendar together with at least an initial portion of the second sequence of rows on the next page of the calendar,

said means for simultaneously exposing comprising a hinging means for hingedly connecting first and last portions of a page, said hinging means provided on each of said separate pages intermediate two of said second sequences of rows thereon,

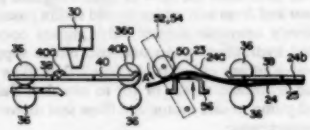
whereby a continuous sequence of rows, representing consecutive ones of said third sequences of time units and provided on successive ones of said pages, is displayed simultaneously to a user.

4,488,367

PAGE TURNING APPARATUS

Masahide Yamauchi, Kawasaki, and Kunio Fukatsu, Ebina, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 26, 1982, Ser. No. 401,715
Claims priority, application Japan, Jul. 31, 1981, 56-120144
Int. Cl.³ G09F *19/00*
U.S. Cl. 40—531 **13 Claims**



1. An apparatus for turning a page of a book which is opened to expose a pair of pages lying within a plane of conveyance of the book, said apparatus comprising:

a roller capable of selectively rotating in first and second opposite directions;

first transfer means for selectively transferring said roller along a conveyance path between a first position above one page of said pair of exposed pages and a second position above the other page of said pair of exposed pages, wherein said one and other pages are picked up and caused to run onto said roller when said roller is respectively in said first and second positions;

pressing means for pressing said one and other pages against said roller when said roller is respectively in said first and second positions, the pressing force exerted by said pressing means being applied in a direction slightly slanted from a direction perpendicular to the book conveyance plane;

driving means for rotating said roller in said first direction when said roller is in said first position so that said one page is picked up and caused to run onto said roller, and for rotating said roller in said second direction, opposite to said first direction, when said roller is in said second position so that said other page is picked up and caused to run onto said roller; and

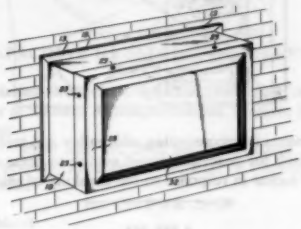
second transfer means for transferring said book in a conveyance direction within said conveyance plane when said one page is located on said roller in said first position so that said roller is shifted from said first position toward said second position thereby turning said one page, and for transferring said book when said other page is located on said roller in said second position so that said roller is shifted from said second position toward said first position thereby turning said other page.

4,488,368

SIGN WITH PERIMETER FLANGE FOR UNIVERSAL MOUNTING

Kelly R. Coleman, 1910 Saddle Hill Rd. South, Dunedin, Fla. 33528

Continuation of Ser. No. 854,253, Nov. 23, 1977, abandoned. This application Jul. 14, 1982, Ser. No. 398,283
Int. Cl.³ G09F *13/04*
U.S. Cl. 40—564 **1 Claim**



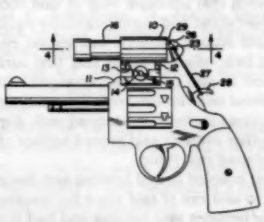
1. A sign comprising a hollow box-like frame body surrounding an interior space, said frame body on at least one side thereof defining a window in which is located a translucent sign facing, said sign body having four enclosure walls of single integral aluminum extrusions of L-shape in transverse cross section, each being extruded from a single piece of metal and each comprising a web wall enclosure portion and a primary mounting end flange portion projecting from the web portion substantially perpendicular thereto and from one side thereof, said four walls being interconnected to each other in an arrangement such that the web portions surround the interior of the sign, a pair of integrally extruded secondary flanges extending from the opposite side of said web wall from said mounting flange one at each end of said web, U-shaped channels integrally formed on said secondary flanges and having open ends extending in opposite directions, self-taping screw mount securing means receivable in said U-shaped channels on said secondary flanges for fastening closure members about the edges of the walls of said secondary flanges at two opposite window positions thereby forming sign mounting means, the frame body walls constituting four extruded web members of a single piece of aluminum with integrally extending primary and secondary flanges directed from opposite surfaces to stiffen the walls, to mount end closure panels and to mount the sign body on a supporting structure.

4,488,369

MARKSMANSHIP TRAINING APPARATUS

Todd Van Note, Rte. #2, Box 326, Frisco, Tex. 75034

Filed May 25, 1983, Ser. No. 498,067
Int. Cl.³ F41C *27/00*; F41G *1/34*
U.S. Cl. 42—1 A **4 Claims**



1. Training apparatus for use in connection with a firearm having a hammer and a barrel comprising:

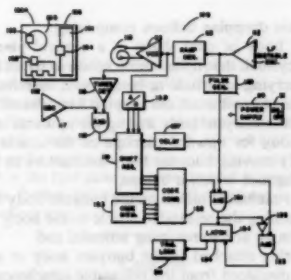
(a) frame means adapted for removeably mounting on said firearm;
(b) barrel means projecting from said frame means and aligned parallel with the barrel of said firearm;
(c) lamp means mounted within said frame means which, when activated, directs light through said barrel means projecting from said frame means;
(d) lens means mounted within said barrel means and adapted to project light emitted by said lamp means along a path parallel with the barrel of said firearm;
(e) circuit means for activating said lamp means mounted in said frame means including switch means normally urged to a first position and moveable to a second position; and
(f) elastic switch activating means connectable between said switch means and the hammer of said firearm to move said switch means from said first position to said second position when said hammer is cocked for firing and to release said switch means to return to said first position when said hammer is released for firing said firearm.

4,488,370

WEAPON CONTROL SYSTEM AND METHOD

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 121,894, Feb. 15, 1980, Pat. No. 4,354,189, which is a continuation of Ser. No. 849,785, Nov. 9, 1977, Pat. No. 4,189,712. This application Feb. 26, 1982, Ser. No. 352,712
Int. Cl.³ F41C *17/08*
U.S. Cl. 42—70 R **4 Claims**



3. A method of controlling the operation of a weapon comprising:
disposing a disenabling means within a weapon for normally preventing its operation,
providing electrical circuit means for operating said disenabling means to permit the operation thereafter of the weapon,
generating an energy field in the vicinity of said weapon and,
altering said energy field by means of a device supported by a person when such device is brought within the realm of said energy field,
detecting when said energy field is altered by the device brought into its realm and generating a control signal,
applying said control signal to said electrical circuit means and causing said electrical circuit means to operate said disenabling means to permit the operation thereafter of said weapon.

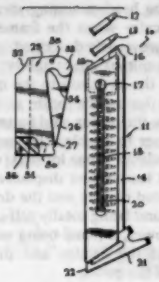
4,488,371

HOLD DOWN LATCH APPARATUS

Edward K. Boyles, 3528 W. 185th St., Torrance, Calif. 90504

Filed Sep. 28, 1982, Ser. No. 425,221
Int. Cl.³ F41C *27/00*
U.S. Cl. 42—90 **1 Claim**

1. A hold down latch apparatus comprising:
an L-shaped body having a top and opposite sides;
a panel carried on opposite sides of said body open at the top and side whereby a recess is defined between the opposing wall surfaces of said panels;
a portion of selected one of a said panels being cut-away to provide an open hook adjacent the open top and open side of said recess;
said L-shaped body having a champered corner at the top opposite from said hook;
said side panels include edges on each side that are angularly disposed on the opposite side with respect to each other in spaced relationship whereby said edges converge together defining an entrance leading into said recess;



said L-shaped base includes a base member along the bottom and an upright back member normal to said base member wherein the interior common surfaces of said members define the back and bottom of said recess opposite to said entrance side and top thereof;
said panel having said hook is provided with an aperture immediately above said hook;
a hole provided in said base member for insertably receiving an attachment chain means; and
said L-shaped base member being provided with an arcuate thumb recess opposite from said hook constituting said champered corner.

4,488,372

HEAD-MOUNTED MOTOR-DRIVEN UNIT

Stephen Lowen, New York, N.Y., assignor to Nadel & Sons Toy Corp., New York, N.Y.

Filed Sep. 30, 1982, Ser. No. 430,723
Int. Cl.³ A63H *33/00*
U.S. Cl. 446—27 **2 Claims**

1. A heat-mountable, esthetic, attention-attracting unit having slow-moving, low-torque, easily stallable, safe, non-bruising, large rotary elements animated by a self-contained, compact, portable, lightweight source of motor power, said unit comprising a head-mounting means, an animated display, and a driving means for said display; said driving means including a low-voltage, low-wattage, low-torque, lightweight, small, easily stallable D.C. motor having an output shaft; said head-mounting means including a lightweight frame constituting three portions of which one is a central portion having oppo-

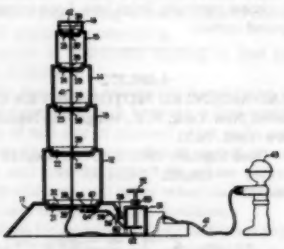
site ends, and the remaining two are temple portions of said mounting means being resilient whereby said mounting means may be placed on a person's head with the central portion thereof atop the person's head and the temple portions lightly pressing against the sides of the person's head; said animated display comprising a lightweight object, lightweight structure supporting said object from said mounting means, said structure including a portion supported by and movable relative to said mounting means, said driving means moving said structure relative to said mounting means, said animated display being two lightweight, attention-getting objects located at the opposite ends of and held by an elongated member secured adjacent its center to the output shaft; means securing the motor to the central portion of the head-mounting means with the output shaft disposed vertically when the frame is on the person's head in the position previously described; said structure having a bore therein, said output shaft tightly fitting in said bore whereby to connect the structure to the motor, and a battery container adjacent the motor with a lightweight battery therein for energizing the motor, said battery container including a detachable cover to enable a person to replace a spent battery, internal resilient arms located within said battery container to prevent inadvertent displacement of the battery; the frame, the animated display and the driving means having a slight total weight and being totally self-contained, including its own source of power, a panel being secured on the head-mounting means and the display and driving means being secured to the top of the panel.

4,488,373

STACKABLE PIECE PLAYSET

David A. Glickson, Evanston, and Harry Disko, S. Barrington, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 3, 1984, Ser. No. 567,733
Int. Cl.³ A63H *33/00*
U.S. Cl. 446—4 **4 Claims**



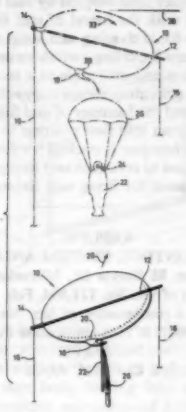
1. A playset comprising:
a hollow base;
a plurality of pieces each having at least two opposed surfaces;
an end piece;
a flexible tether of a predetermined length;
one end of the tether secured to the end piece;
the tether passing through the opposed surface of the plurality of pieces and being movable with respect to the pieces;
the portion of the tether remaining after passing through the opposed surfaces of the plurality of pieces passing through the base such that pulling upon the other free end of the tether stacks the pieces upon the base in a predetermined order;
a first class lever mounted at least partially within the base;
an opening in the base permitting engagement of a load arm of the lever with one of the opposed sides of the piece adjacent the base in the predetermined order; and
means outside the base permitting exertion of a force on an effort arm of the lever to topple the stacked pieces.

4,488,374

ARTICLE DROPPING BALLOON

Lloyd C. Elson, 156 Columbia Dr., Huron Park, Ontario, Canada N0M 1Y0

Filed Oct. 28, 1983, Ser. No. 546,756
Int. Cl.³ A63H *3/06*
U.S. Cl. 446—220 **10 Claims**



1. An article dropping balloon comprising:
a buoyant body of oval shape in a vertical plane and of buoyancy such that it can move upwards by its buoyancy in air carrying an article to be dropped therefrom;
at least one releasable article adapted for releasable attachment to the buoyant body during the upwards movement of the body for upward carriage of the article until the upwardly moving buoyant body encounters an overhead surface against which it bumps;
releasable attachment means on the buoyant body for releasably attaching the releasable article to the body when the body is in an article retaining attitude; and
a tether string attached to the buoyant body at a location thereon displaced from the releasable attachment means;
the releasable attachment means releasing the releasable article therefrom upon a sudden change in vertical movement of the buoyant body caused by its engagement with the said overhead surface, the release of the article being facilitated by a change of the buoyant body from an article retaining attitude to an article releasing attitude resulting from the buoyant body encountering the said overhead surface.

4,488,375

TOY VEHICLE WITH PIVOTABLE BODY

Lap K. Cheng, Kowloon, Hong Kong, assignor to Hang Tjuk Industrial Col Ltd., Kowloon, Hong Kong

Filed Sep. 24, 1982, Ser. No. 423,044
Claims priority, application United Kingdom, Sep. 29, 1981, 8129404
Int. Cl.³ A63H *17/36*
U.S. Cl. 446—443 **5 Claims**

1. a toy vehicle, which comprises a frame, a body, the body being pivotally mounted on the frame, and means for effecting movement of the vehicle and for effecting pivotal movement of the body relative to the frame, wherein the movement effecting means comprises a shaft rotatably and slidably mounted relative to the frame, a clutch for effecting axial movement of the shaft from a first axial position thereof to a second axial position thereof, the clutch comprising a first gear wheel fixedly mounted on the shaft, inclined flanges provided on the first gear wheel, a second gear wheel slidably and rotatably

mounted on the shaft and inclined flanges provided on the second gear wheel and adapted to cooperate with the inclined flanges of the first gear wheel, the gear ratio between the first and second gear wheels being other than one, means for restoring the shaft to the first position thereof, an electrically powerable motor fixed on the frame, a gear means for simultaneously engaging and driving the first and second gear wheels, the gear means being rotatably mounted with respect to the frame and

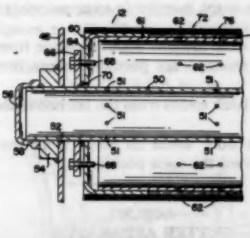
rotatable by means of the electrically powerable motor, and a further gear means for engaging the first gear wheel when the shaft is in the second axial position thereof and wherein the toy vehicle further comprises a first wheel axle rotatably mounted to the frame, a wheel fixed to each of two ends of the first wheel axle and a pinion for engaging the first gear wheel when the shaft is in the first axial position thereof, wherein the pinion engages the further gear means at all times and is fixed to the said first wheel axle.

4,488,376

HERBICIDE APPLICATOR APPARATUS

Bill Wilson, P.O. Box 25, Lutz, Fla. 33549

Filed Apr. 11, 1983, Ser. No. 483,712
Int. Cl.³ A01C *15/00*
U.S. Cl. 47—1.5 **7 Claims**



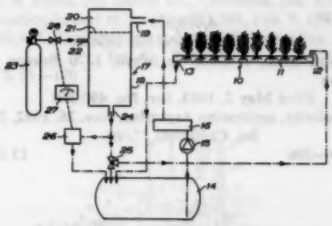
1. A contact roller herbicide applicator apparatus for eliminating weeds and other undesired foliage comprising a roller applicator rotatably mounted on a frame, a roller applicator supply in fluid communication with said roller applicator mounted on said frame to feed herbicide from said roller applicator supply to said roller applicator and a roller drive means coupled between said frame and said roller applicator to rotate said roller applicator when said contact roller herbicide applicator apparatus is moved over the ground, said roller applicator comprising a roller reservior including a hollow roller element including at least one aperture formed therein having a porous pad disposed in surrounding relation relative thereto and a hollow roller applicator axle disposed within said hollow roller element including at least one aperture formed therein, said roller applicator supply feeding herbicide to the interior of said hollow roller applicator axle to be dispensed therefrom into said roller reservoir for feeding from said hollow roller element aperture through said porous pad to the weeds or other undesired foliage.

4,488,377

METHOD OF CULTIVATING PLANTS WITHOUT SOIL

Ernst H. S. Sjöstedt, P.O. Box 4212, S-260 73 Östra Ljungby, Sweden

PCT No. PCT/SE81/00004, § 371 Date Sep. 10, 1981, § 102(e) Date Sep. 10, 1981, PCT Pub. No. WO81/01940, PCT Pub. Date Jul. 23, 1981
Continuation of Ser. No. 302,411, Sep. 10, 1981, abandoned. This PCT application Jan. 12, 1981, Ser. No. 494,142
Claims priority, application Sweden, Jan. 11, 1980, 8000232
Int. Cl.³ A01G *31/00*
U.S. Cl. 47—59 **3 Claims**



1. In a method for the cultivation of plants without soil by supplying an oxygenated nutrient solution to the root system of the plants, the improvement comprising oxygenating the nutrient solution by passing the nutrient solution, before it is supplied to the plants, in finely divided form through an atmosphere of substantially pure gaseous oxygen under pressure, maintaining imminent mixing contact between the solution and the gaseous oxygen sufficient to achieve a dissolved oxygen content of at least 4.5 ppm in the nutrient solution, continuously measuring the dissolved content of the oxygen in the solution following mixing and before circulating the oxygen enriched nutrient solution back to the root system of the plants and adjusting the volume of oxygen supplied to the mixing step depending on the quanity of oxygen measured.

4,488,378

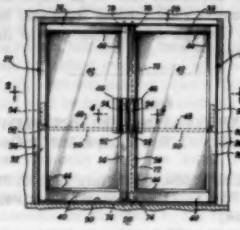
BUILDING ENTRANCE

Ernest B. Symon, South Bend, Ind., assignor to Kawneer Company, Inc., Atlanta, Ga.

Filed Feb. 28, 1983, Ser. No. 470,188
Int. Cl.³ E05C *15/02*; E05B *65/10*
U.S. Cl. 49—141 **13 Claims**

1. An entrance for buildings, comprising:
first and second doors mounted in a common frame, each door including a lock stile positioned adjacent a lock stile of the other door when said doors are closed;
a panic device for emergency opening of at least one door;
latch means for securing said one door in latched engagement with said frame;
a retractable latch extending between the stiles of said doors when closed for minimizing the possibility of unauthorized, forced separation of the stiles; and
means operatively interconnecting said latch with said panic device for retraction of the latch when said panic device is actuated, and also operatively interconnecting said latch means with said panic device for unlatching said one door from said frame when said panic device is actuated, in-

cluding slide means mounted in said lock stile of said one door for reciprocal movement longitudinally thereof between latch extending and latch retracting positions of



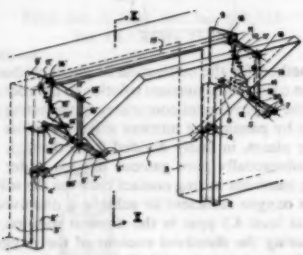
said latch means and having a first leg substantially parallel to a door face of said one door and a second leg substantially normal thereto.

4,488,379

SPRING BALANCED DOOR

Ernesto Blumenthal, Avenida de Mayo, 1370 Buenos Aires, Argentina

Filed May 2, 1983, Ser. No. 490,348
Claims priority, application Argentina, Nov. 26, 1982, 291423
Int. Cl.³ E05D *15/40*
U.S. Cl. 49—206 12 Claims



1. A balanced door for closing a passage in a door frame, comprising:

a closure panel with opposite lateral edges and having a closed position and an open position which is at an angle to the closed position;

support means adapted to be connected to the door frame for establishing a fixed frame of reference;

two spaced substantially vertical guide tracks adapted to be connected to the door frame;

a guide roller connected to each lateral edge of said panel and each movable in one of said guide tracks;

a rigid arm connected to each lateral edge of said panel adjacent an intermediate location of each lateral edge, respectively, each rigid arm extending substantially perpendicularly to a plane of said panel and from an interior surface of said panel;

two lever arms, each journaled between one of said rigid arms and said support means, and each pivotally connected to a respective rigid arm at a pivot joint;

at least one biasing means connected between one of said lever arms and said support means for biasing said panel toward its open position; and

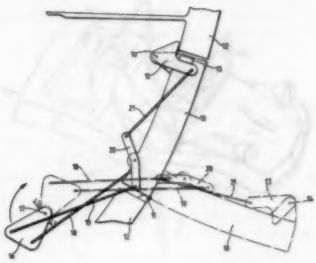
stop means connected to said support means and engaged with at least one of said lever arms at an inclined position of said panel between its closed and open positions, said panel being further movable toward said opened position by rotation of said panel about said pivot joints.

4,488,380

DOOR ARRANGEMENTS

Eric R. Howse, Christchurch, England, assignor to British Aerospace Public Limited Company, London, England

Filed Dec. 8, 1982, Ser. No. 447,938
Claims priority, application United Kingdom, Dec. 10, 1981, 8137364
Int. Cl.³ E05F *11/02*
U.S. Cl. 49—279 6 Claims



1. A door and latch sequencing mechanism which includes a door member hinged for hinging movement between an open and a closed position, latch means carried by said door member and movable between a latched position in which it latches the door member in the closed position and an unlatched position, a crank member mounted for turning movement about a fixed axis, first connecting rod means connecting the crank member to the door for effecting opening and closing thereof, second connecting rod means connecting the crank member to the latch means for effecting latching and unlatching thereof, the mechanism being arranged so that when the door is latched in its closed position, said first connecting rod means is in a before dead center position with respect to opening movement of the crank member and said second connecting rod means is between a position including said rod means being before a dead center position and a position wherein said rod means is at a dead center position with respect to said crank member, whereby an opening force on the door member is effective to hold the latch means in its latched position, but that turning movement of the crank member in an appropriate single sense sequentially

(a) moves the door member about its hinge from the closed position to a temporary position remote from the open position,

(b) moves the latch means from the latched to the unlatched position,

(c) moves the door about its hinge from the temporary position toward the open position.

4,488,381

CUTTER APPARATUS

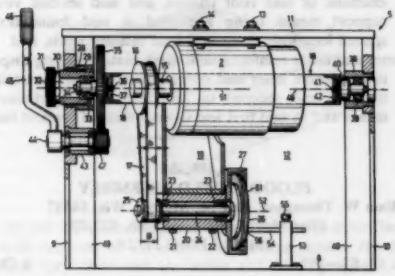
Erhard Konersmann, Wallisellen, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zürich, Switzerland

Filed Sep. 15, 1982, Ser. No. 418,417
Claims priority, application Switzerland, Sep. 30, 1981, 6294/81
Int. Cl.³ B24B *41/04*
U.S. Cl. 51—98 R 9 Claims

1. A cutter apparatus for producing at least one surface of a cutter head at a hardened steel cutter blade, comprising:

a drive motor;

a cutter grinding disk pivotably mounted about a predetermined pivot axis;
a belt drive drivingly interconnecting said drive motor and said cutter grinding disk;
said belt drive containing a drive pulley operatively associated with said drive motor;
a power take-off pulley operatively associated with said cutter grinding disk;
a drive belt for operatively connecting said drive pulley with said power take-off pulley;
a mounting device for the cutter grinding disk and said power take-off pulley;
means for pivoting said mounting device about said predetermined pivot axis and therewith pivoting the cutter



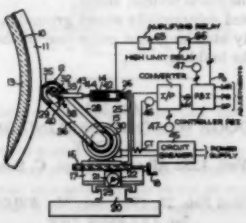
grinding disk essentially parallel to a movement plane in order to cut the surface of the cutter head at the cutter blade;
means for displacing said mounting device and thus the cutter grinding disk relative to said drive motor along a predetermined displacement path and substantially along said predetermined pivot axis in order to compensate for wear of the cutter grinding disk;
said power take-off pulley having a width which exceeds the width of the drive belt by an amount which corresponds to said predetermined displacement path of said mounting device and thus of the cutter grinding disk; and
means defining an adjustable reference surface for setting said movement plane and thus to enable positioning of the cutter grinding disk in a desired cutting plane.

4,488,382

KILN RING GRINDING APPARATUS

Charles J. Zajac, and Allois F. Geiersbach, both of Milwaukee, Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Apr. 29, 1983, Ser. No. 489,704
Int. Cl.³ B24B *49/08*
U.S. Cl. 51—165.92 **5 Claims**



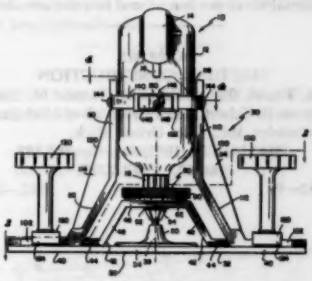
1. An apparatus for grinding the peripheral surface of a rotary circular member comprising:
a grinder;
means including an electrical motor for continually driving said grinder;
means for sensing the magnitude of current flowing to said motor;
pneumatic cylinder means for urging said grinder against said peripheral surface with a force proportional to pressure of fluid supplied to said pneumatic cylinder;
means for generating a first fluid flow at a pressure which is a function of the sensed magnitude of current flowing to said motor;
means for selectively establishing a second fluid flow having a pressure proportional to a desired current flow to said motor;
means for comparing said pressures of said first and second flows and providing a flow of fluid to said pneumatic cylinder at a pressure which will force said grinder against said surface at force sufficient for said sensed current flow to equal said desired current flow.

4,488,383

APPARATUS FOR SUPPORTING PORTABLE HAND TOOLS

Lowell B. Zerbe, 317 Sunset Dr., Columbus, Ind. 47201

Continuation-in-part of Ser. No. 232,399, Feb. 9, 1981, Pat. No. 4,403,457. This application Jul. 5, 1983, Ser. No. 510,820
Int. Cl.³ B24B *23/02*
U.S. Cl. 51—170 T **8 Claims**



1. An apparatus for supporting a portable rotary tool for use as a rotary sander, the tool having a chuck adapted to receive a sanding pad, the apparatus comprising a base member having a longitudinal axis, the base member providing an opening having a central axis at generally a right angle to the base member, clamping means for engaging and supporting the rotary tool on the base member so the sanding pad is received in the opening, and resilient means for biasing the clamping means with respect to the base member whereby the sanding pad is forced against a work surface through the opening in the base member.

4,488,384

ROOF EDGE CONSTRUCTION

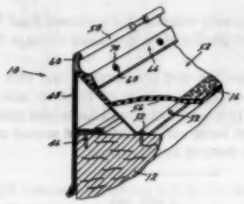
John B. Hickman, Asheville, N.C., assignor to W. P. Hickman Co., Asheville, N.C.

Filed Apr. 23, 1981, Ser. No. 256,893
Int. Cl.³ E04D *13/5*
U.S. Cl. 52—60 **17 Claims**

1. A cant securing assembly for a roof edge structure of the type forming a raised edge structure or gravel stop and a water dam around the periphery of a roof deck comprising:
an elongated cant member having a flange portion adapted for flush surface engagement with a top surface of said roof deck, an inclined sheet portion sloping generally upwardly from said flange portion and generally toward the edge of said roof deck when said cant member is positioned on said roof deck, and a generally vertical sheet

portion turned downwardly from said inclined sheet portion and extending downwardly to a position at least generally adjacent said top surface of said roof deck when said cant member is positioned thereon; and

an elongated retainer member including a horizontal sheet portion adapted to be fastened to said top surface of said roof deck and including a generally vertical sheet portion turned downwardly from said horizontal sheet portion



and adapted to be positioned along an outer vertical face surface of said roof deck when said retainer member is fastened to the top surface thereof, and having securing means for confining the movement of at least said vertical sheet portion of said cant member, said securing means including interlocking means for interlockingly attaching said vertical sheet portion of said cant member to said horizontal sheet portion of said retainer member.

4,488,385

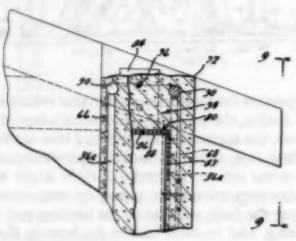
BUILDING CONSTRUCTION

William A. Teasel, Bloomfield Hills; Thomas M. Teasel, Troy, and Thomas R. Colwell, Lake Orion, all of Mich., assignors to NFS Industries, Inc., Lake Orion, Mich.

Filed May 28, 1982, Ser. No. 383,347

Int. Cl.³ E04B 7/02

U.S. Cl. 52—92 **3 Claims**



1. In a building structure of the type having a poured concrete foundation, a roof structure including a roof truss at each end of said building structure and a plurality of spaced roof trusses therebetween, and a wall structure having load bearing walls supported by said foundation and supporting said roof structure, the improvement

wherein said load bearing walls comprise internal wall forms coated with inner and outer layers of cementitious material;

wherein said foundation includes a bearing surface adjacent said wall forms for supporting said cementitious material; and

wherein said load bearing walls are provided with a plurality of truss brackets each having a pair of spaced, downwardly-extending flanges and upwardly-extending flanges interconnected by a base plate, said downwardly-extending flanges engaging opposite sides of said wall forms and said upwardly-extending flanges being adapted to be secured to said roof trusses, and bearing plates disposed between the base plates of said truss brackets and the upper edges of said wall forms, and

first and second vertical support means comprising attachment means for attaching said wall forms to said roof trusses and for aligning said wall forms in a predetermined relationship relative to said foundation, and

a reinforcing structure for said cementitious material, said reinforcing structure and said wall forms being encased within said cementitious material, said attachment means including horizontal load-carrying means interconnecting said roof trusses, said first vertical support means comprising rod means having hooked portions anchored in said foundation and extending upwardly through the outer layers of said load bearing walls to a position closely adjacent said horizontal load-carrying means and the endmost of said roof trusses, and said second vertical support means being anchored in said foundation at spaced locations along said load bearing walls, and

inner and outer reinforcement mesh material being disposed in respective inner and outer layers of said cementitious material and secured to said horizontal load-carrying means and to said first and second vertical support means.

4,488,386

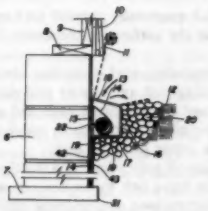
FLOOD SHIELD ASSEMBLY

William W. Thompson, Box M, Mercer, Wis. 54547

Filed Nov. 1, 1982, Ser. No. 437,898

Int. Cl.³ E04G 21/24

U.S. Cl. 52—169.1 **6 Claims**



1. A flood shield assembly for providing an exterior waterproof barrier for a building having a foundation and an outside wall supported above ground surface level, comprising:

a storage box located exteriorly of the building at substantially ground surface level and extending lengthwise along the wall;

a shield of flexible, waterproof material contained within said box having one end fixedly attached to and covering the foundation of the building and extending substantially below ground surface level and its other end removable from said box so that in the event of a flood threat said other end of the shield may be drawn upwardly along the exterior of the wall to provide a barrier between the building and the flood waters; and

means located substantially above ground surface level for removably attaching said other end of the shield to the wall of the building.

4,488,387

SLIDING DOOR WEATHER-SEALING DEVICE AND ASSEMBLY

Frederick A. Foti, 1352 Albany St., Apt. C, Schenectady, N.Y. 12304

Filed Feb. 28, 1983, Ser. No. 470,056

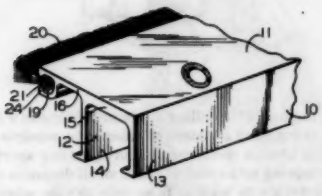
Int. Cl.³ E06B 1/04

U.S. Cl. 52—207 **2 Claims**

1. A sliding door assembly incorporating combination securing and weather sealing means said assembly comprising:

(1) a door frame including:

(a) a head,
(b) a sill having an inner flange and an outer flange to support a sliding screen and a door-supporting rail between and spaced from said inner and outer flanges, and
(c) jambs joining the ends of the head and sill and providing therewith a generally rectangular upright door containment structure;
(2) a first stationary door mounted in the frame and a second door supported on rollers engaging the said sill rail for lateral motion of the second door in the frame; and,
(3) a weather sealing and securing device comprising an elongated rigid generally channel-shaped body disposed and secured in place in the door frame sill between the sill



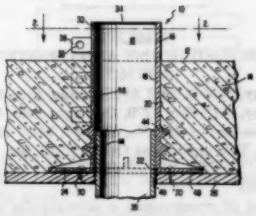
rail and the outer flange and spaced from said outer flange with one end of the said body bearing against the first stationary door and the other end bearing against the opposed jamb of the door frame whereby said first door is locked in place in the door frame, said body having a lateral flange extending toward the inner flange of the sill substantially the full length of the body and a reentrant cavity formed in and extending the full length of the free edge of the flange, and said weather sealing and securing device including in addition a sealing strip of non-binding deformable non-metallic material disposed in said reentrant cavity and projecting therefrom over substantially the full length of the body for weather sealing engagement with the second door surface.

4,488,388

SUPPORTING PIPE CLAMP

Victor P. Schmidt, 6527 Las Flores Dr., Boca Raton, Fla. 33433

Filed Jul. 7, 1982, Ser. No. 396,037
Int. Cl.³ E04F *17/00*
U.S. Cl. 52—221 **24 Claims**



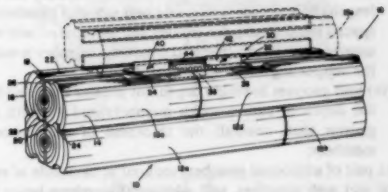
14. A tubularly-shaped pipe-supporting clamp for being embedded in an initially form-sustained floor of a building structure molded of masonry material, said clamp being fixedly attached to a surface of said form prior to introduction of said masonary material into said form so as not to move when said masonary material is introduced into said form and extending upwardly therefrom, to produce a pipe passageway through said molded floor at a particular position, said tubularly shaped pipe supporting clamp comprising:
(a) a substantially rigid sleeve having at least an inner surface defining a tubular wall through which a pipe to be clamped passes and an outer surface,
(b) flange means at one end of said sleeve for attaching said device to said form,
(c) anchor means formed in said outer surface of said sleeve for preventing axial movement of said device in said masonry floor after it has cured,
(d) a forcing means for holding said pipe against movement relative to said sleeve, said forcing means including at least one longitudinally-extending slot-shaped recess formed in the inner surface of said wall extending from the other end of said sleeve for a distance substantially greater than half the length of said sleeve, but with the sleeve not having said recess at other longitudinal positions so that the sleeve rather closely encircles said pipe at said other longitudinal positions, said forcing means further including a wedge means longitudinally slidable by longitudinal linear movement in said recess between the inner wall of said sleeve and the outer surface of a pipe when said pipe is in said passageway for simultaneously engaging said pipe and the inner surface of said wall in said slot to wedge therebetween with increasing force as said wedge means is longitudinally slid in said recess to hold said pipe and said wedge against movement in said sleeve, said other end of said sleeve being adapted to be cut off to allow said sleeve to be cut to various lengths ranging from its original length to substantially less than half its original length, whereby when said other end is cut off to an extent substantially greater than half the length of the sleeve there remains a slot shaped recess into which the wedge means can be longitudinally slid.

4,488,389

SECURING MEANS FOR LOG CONSTRUCTION

Johann H. Farmont, 434 Golden Gate Ave., Belvedere, Calif. 94920

Filed Dec. 20, 1982, Ser. No. 451,416
Int. Cl.³ E04B *1/10, 1/38;* F16B *1/00*
U.S. Cl. 52—233 **8 Claims**



1. A building wall comprising:
a plurality of stacked logs;
each of said logs having a pair of side surfaces and generally planar top and bottom surfaces;
a slot cut into each of said planar surfaces to extend along the length thereof; and
a log joiner securing vertically adjacent logs together comprising:
a metal plate;
a first cluster of pointed projections depending from said metal plate over a first area adjacent one end thereof penetrating a first lower log;
a second cluster of pointed projections extending upward from said metal plate over a second area displaced from said first area penetrating an upper log supported on said lower log;
a first vertical bar extending upward from said plate longitudinally across said first area received in the slot in the bottom of said upper log; and
a second vertical bar depending from said plate longitudi-

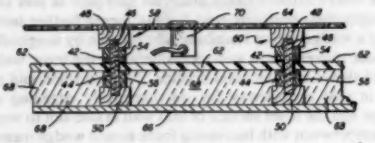
nally across said second area received in the slot in the top of said first lower log.

4,488,390

STRUCTURAL BUILDING MEMBERS AND WALL INCORPORATING SAME

Cass F. Mulford, R.D. 3, Canastota, N.Y. 13032

Filed Apr. 26, 1982, Ser. No. 371,905
Int. Cl.³ E04B 2/14
U.S. Cl. 52—407 4 Claims



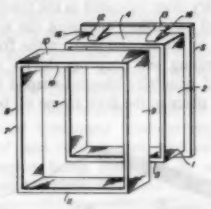
1. A building wall construction comprising, in combination:
(a) a plurality of elongated studs arranged in spaced, vertical, parallel relation;
(b) each of said studs comprising:
(i) first and second elongated rectangular wooden members, substantially identical to one another in length, width and thickness, each having a substantially rectangular groove in one face thereof, said grooves extending the entire length of said wooden members, centrally of the width, and having widths and depths a fraction of the width and thickness of said wooden members;
(ii) a web member of pressed fiber board having a density significantly less than and a length the same as said wooden members, a thickness substantially equal to the width of said grooves, and a width greater than the individual widths of said wooden members; and
(iii) means securing opposite marginal edge portions of said web member in said grooves, substantially the full length thereof, thereby joining said wooden members in spaced relation, the dimensions and material of said web member being such that said structural member is suited for supporting loads applied at the ends;
(iv) said grooves having a depth not greater than one-half the depth of said wooden members and a width not greater then one-half the thickness of said wooden members;
(c) a pair of additional members secured to each side of each of said web members, said additional members being the same length as said studs and a depth less than one-half the distance between said wooden members and secured to said web members in spaced relation to form a channel of predetermined width open along one side and bounded on opposing sides by said additional members and on the bottom by said web members;
(d) a panel member having a height equal to the length of said studs, a width slightly less than the distance between said web members of consecutive studs in said wall, and a thickness less than said predetermined width, said panel member having edge portions extending into said channels of consecutive studs for support thereby and forming enclosed spaces between said sheathing members and each side of said panel member; and
(e) sheathing members secured to opposite sides of said studs to enclose the latter and the spaces therebetween, whereby substantially all loads carried by said studs are in a longitudinal direction and said web member of each stud acts as both thermal and sound insulator between said wooden members and said sheathing members.

4,488,391

CENTERING CLIPS FOR WINDOW FRAMES

Joseph Pavnica, 311 S. Midland Ave., Joliet, Ill. 60436

Continuation of Ser. No. 090,165, Oct. 31, 1979,. This application Dec. 17, 1980, Ser. No. 217,473
Int. Cl.³ E06B 1/56
U.S. Cl. 52—741 3 Claims



1. The method of installing a window frame in a mounting aperture, comprising the steps of selecting a window frame of appropriate size for mounting in said mounting aperture with room for moving said window frame small distances upwardly and downwardly as well as from side to side when initially inserted into said mounting aperture to center said window frame within said mounting aperture, selecting at least one spring clip having a base for anchoring to an end wall of said window frame and having a resilient member extending diagonally from said base whose free end includes engagement means spaced apart from said base a distance at least equal to the dimension by which said mounting aperture is greater than said window frame in said upward and downward direction, anchoring said base of said clip to one of the top and bottom walls of said window frame with the said free end of said resilient member slanting diagonally outwardly and away from the direction in which said window frame is to be inserted into said mounting aperture, inserting said window frame into said aperture, causing said free end of said resilient member of said spring clip to engage the corresponding facing portion of said mounting aperture with the opposite end wall of said window frame abutting against the corresponding portion of said mounting aperture which faces said opposite end wall of said window frame, letting go of said window frame to obtain tools and equipment for permanently securing said window frame in a mounting aperture allowing said spring clip in engagement with a portion of said mounting aperture to temporarily retain said window frame therein, and permanently connecting said window frame in said mounting aperture.

4,488,392

UNDERGROUND HOUSE AND CONSTRUCTION METHOD

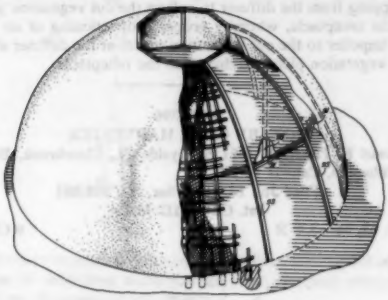
Dale A. Pearcey, 3730 S. Mill Ave., Tempe, Ariz. 85282, and L. Gene Pearcey, P.O. Box 3270, Durango, Colo. 81301

Continuation-in-part of Ser. No. 130,559, Mar. 14, 1980, Pat. No. 4,352,260. This application Oct. 1, 1982, Ser. No. 432,263
Int. Cl.³ E04G 21/00
U.S. Cl. 52—742 17 Claims

1. A method of constructing a substantially underground building, said method comprising the steps of:
(a) excavating an opening in the ground, said opening having a level bottom;
(b) pouring a quantity of cementitious material into a predetermined region of said hole to form a foundation;
(c) attaching a plurality of lower connecting elements to peripheral portions of said foundation;
(d) positioning an upper connecting member a predetermined height above a roughly central portion of said bottom;
(e) attaching the lower end of each of a plurality of arch members to a respective one of said lower connecting

elements and connecting the upper end of each of said arch elements to a respective point of said upper connecting member so that said arch members are rigidly supported in a generally dome-like configuration over said bottom;

(f) supporting semi-rigid mesh on the outer surfaces of said arch members and supporting a layer of fabric on the outer surface of said mesh, said fabric being sufficiently closely interwoven to prevent appreciable amounts of cementitious material subsequently applied to said fabric from passing through said fabric prior to hardening;



(g) positioning a plurality of rigid reinforcing rods adjacent to the outer surface of said fabric, at least some of said reinforcing rods engaging and being supported by various ones of said arch members; and

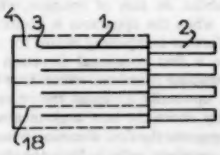
(h) applying a layer of plastic cementitious material to the outer surface of said fabric, said plastic cementitious material covering said reinforcing members, causing at least some of said reinforcing members to be embedded in said plastic cementitious material.

4,488,393

METHOD FOR PACKAGING STERILE ACUPUNCTURE NEEDLES

Tran dinh Can, 20, Avenue de Friedland, 75008 Paris, France

Filed Mar. 19, 1982, Ser. No. 360,081
Claims priority, application France, Mar. 20, 1981, 81 05569
Int. Cl.³ B65B *9/00*
U.S. Cl. 53—450 **2 Claims**



1. A method for packaging sterile acupuncture needles having thin needle and enlarged handle portions, the method comprising the steps:

covering only parallel adjacent needle portions with a first continuous strip of material so that the handle portions remain exposed;

depositing a second continuous strip of material over only the needle portions, in overlying relation with the first strip thereby retaining exposure of the handle portion;

bonding the strips together for hermetically sealing the needles in a permanently sterile continuous package;

forming serrations in the package, between each adjacent needle, for maintaining the needles in a continues connected package which permits folding of the packaged needles along the serrations and tearing of any desired number of packaged needles from the remaining continuous package; and

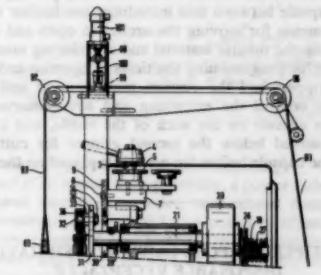
whereby the adhesion between the strips and the material is low enough so that individual needles are removable from the package by grasping their handle portions and pulling them from the package.

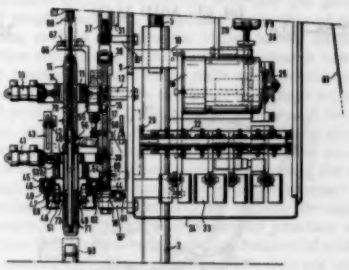
4,488,394

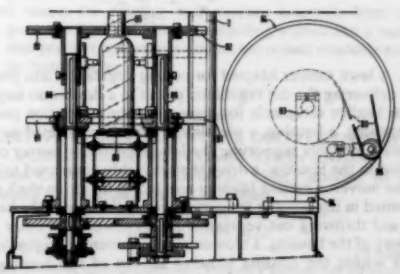
BOTTLE-SEALING MACHINE

Clemente del Ser Gonzalez, Paseo Talleres, No. 36, Madrid, Spain

Filed Apr. 16, 1981, Ser. No. 254,769
Claims priority, application Spain, Apr. 19, 1980, 490.733
Int. Cl.³ B65B *11/00*
U.S. Cl. 53—585 **13 Claims**







1. A bottle-sealing machine for placing capsules of thermoshrinkable plastic tubular material obtained from a continuous coil on the necks of bottles, comprising a bed frame, a linear transporter belt established on said bed frame for entraining the bottles, retention mechanisms for stopping each bottle in the

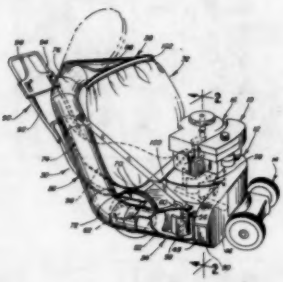
region where the bottle is to receive a capsule for the time necessary for placing the capsule on the neck of the bottle, two vertical cylindrical guides situated on said bed frame, a headpiece mounted on said guides in a manner such that said headpiece can adopt any stable position along the length of said guides, said headpiece including a vertical plate, a first gripper fixed to a front of said plate, and a motor situated on a back face of said plate, the shaft of said motor extending through said plate and incorporating an eccentric which, through a connecting rod, supplies a reciprocal vertical movement to a second gripper aligned with said first gripper and situated below it, each of said grippers including two semicylindrical arches forming generally circular apertures for receiving the tubular material, wherein the imaginary axes of said arches are vertically aligned; an elongated introducer mechanism positioned within the circular apertures of the grippers to receive the tubular material so that as the tubular material is advanced through said apertures it simultaneously circumferentially surrounds the introducer mechanism thereby placing the continuous capsule between said introducer mechanism and said grippers, means for moving the arches to open and close to thereby grip the tubular material and introducing mechanism, and means for programming the times of opening and closing of said grippers and the vertical movement of said second gripper to control the entraining and advancement of the continuous capsule on the neck of the bottle, and a cutting device mounted below the second gripper for cutting and forming the capsule before the capsule is placed on the neck of the bottle.

4,488,395

MULTIPLE PURPOSE LAWN MOWER HAVING DISPOSABLE RECEPTACLE

Ralph B. Mack, 196 Green Bay Rd., Glencoe, Ill. 60022

Filed Apr. 28, 1983, Ser. No. 489,527
Int. Cl.³ A01D *35/26*
U.S. Cl. 56—13.4 **10 Claims**



1. A lawn mower adapted for cutting vegetation into pieces and delivering the cut vegetation pieces to a flexible air impervious baglike receptacle for disposal of the vegetation pieces comprising, a housing, a plurality of wheels connected to the housing movably supporting the housing, a prime mover connected to the housing, a drive shaft drivably connected to the prime mover, a cutting blade connected to the drive shaft and mounted in the housing for cutting vegetation under the housing and throwing out vegetation pieces toward the outer periphery of the housing, a blower impeller mounted on the drive shaft within the housing blowing air out of the housing, a junction being a portion of the housing for receiving cut vegetation pieces propelled by the blade and air blown by the impeller for moving the cut vegetation pieces, a mixing vane valve mounted in the junction with one side of the vane valve adjacent to the cut vegetation pieces propelled by the blade and the other side of the vane valve adjacent to the air blown by the impeller with the air blown by the impeller merging with the cut vegetation pieces propelled by the blade beyond the end of the vane valve, said vane valve selectively proportioning the amount of air received from the impeller to the volume of flow of blade impelled cut vegetation pieces, said junction being spaced from the drive shaft a distance greater than the distance from the drive shaft to the end of the cutting blade, a conduit connected to the junction for carrying the cut vegetation pieces propelled by the blade and the air in an upward direction, a head connected to the upper end of the conduit, said head having a diffuser to allow air to leave the head and to allow the cut vegetation pieces to drop down due to gravity, and an air impervious flexible baglike receptacle connected to the head for receiving the cut vegetation pieces dropping from the diffuser to collect the cut vegetation pieces in the receptacle, whereby proper proportioning of air from the impeller to the cut vegetation pieces at the diffuser allows the vegetation pieces to drop into the receptacle.

4,488,396

ROTARY CONE HARVESTER

Helmut E. Fandrich, 2461 Sunnyside Pl., Clearbrook, British Columbia, Canada V2T 4C4

Filed Jul. 14, 1982, Ser. No. 398,094
Int. Cl.³ A01D *46/24*
U.S. Cl. 56—328 R **9 Claims**

1. An apparatus for harvesting seed cones from a tree, the apparatus comprising:

(a) a lower guide portion having an opening for embracing the tree and permitting vertical movement of the apparatus with respect to the tree; and

(b) an upper cone retrieving portion having a rotatable cone remover with a plurality of outwardly extending members for separating cones from the tree, the cone remover being rotatable about an axis of rotation which is generally horizontal when the apparatus is positioned for use, the apparatus further comprising means for rotating the cone remover in a first rotational direction where the outwardly extending members which face the trunk of the tree move upwardly to assist the apparatus in moving downwardly about the tree and, in a second rotational direction opposite the first direction where the outwardly extending members which face the tree move downwardly to assist the apparatus in moving upwardly about the tree.

4,488,397

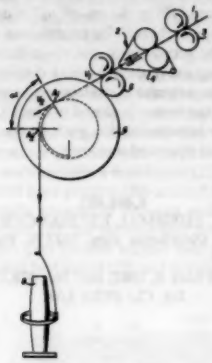
DEVICE FOR STRETCHING, CONDENSING AND TRANSPORTING A ROVE OF FIBERS DURING A SPINNING OPERATION

Jean Venot, Roanne, France, assignor to ASA S.A., France

Filed Jan. 17, 1983, Ser. No. 458,713
Claims priority, application France, Jan. 26, 1982, 82 01383
Int. Cl.³ D01H *5/72*
U.S. Cl. 57—328 **16 Claims**

1. A device for stretching a rove of fibers during a spinning operation to permit forming the rove into spun yarn, comprising: a condenser element located apart from and placed after a

means for stretching the rove, wherein said condenser element comprises a movable guiding surface, upon which the fibers are delivered tangentially, said guiding surface permits a pull-



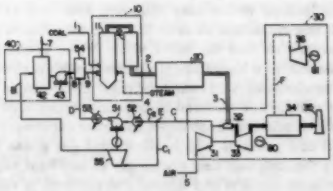
ing force to be exerted on an end of the fibers coming out of the means for stretching and limits the twist run-back communicated by the spinning system.

4,488,398

POWER PLANT INTEGRATED WITH COAL GASIFICATION

Yoshiki Noguchi, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 29, 1982, Ser. No. 437,676
Claims priority, application Japan, Nov. 9, 1981, 56-178457
Int. Cl.³ F02C *3/28*
U.S. Cl. 60—39.12 **6 Claims**



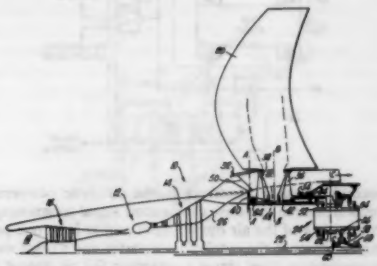
1. A power plant comprising a coal gasification plant means for producing a combustible gas by reaction of coal with a gasifying agent containing at least oxygen as an effective component, an oxygen plant means for separating oxygen from air and for supplying the gasifying agent containing separate oxygen to the coal gasification plant means, a gas turbine plant means including a gas turbine means adapted to be driven by the combustible gas from the coal gasification plant means, an air compressor means for supplying compressed air to the gas turbine means, means for bleeding a portion of compressed air from said air compressor means, means for supplying a portion of the compressed bled air as feed air to the oxygen plant means, and an air dilution supply means for supplying another portion of the bled compressed air as dilution air to a gasification agent supply means for supplying the gasification agent to the gasification plant means, including a further air compressor means for elevating the pressure of the portion of the bled compressed air supplied as dilution air, and heat exchanger means for cooling the air compressed by said further air compressor means.

4,488,399

PROPFAN AIRCRAFT PROPULSION ENGINE

Charles W. Robey, Kings Newton, and Harry W. Bennett, Duffield, both of England, assignors to Rolls-Royce Limited, London, England

Filed Jan. 24, 1983, Ser. No. 460,272
Claims priority, application United Kingdom, Feb. 17, 1982, 8204665
Int. Cl.³ F02K *1/46*
U.S. Cl. 60—262 **3 Claims**



1. An aircraft propulsion engine comprising:
an annular air intake, a gas generator, a power turbine and an exhaust duct in flow series, said exhaust duct having a downstream end defined by a plurality of adjacent chutes, alternate ones of said adjacent chutes directing flow of exhaust gases and ambient air respectively in a downstream axial direction;
a propfan assembly positioned at the rear of the aircraft propulsion engine and coaxial with said gas generator, said propfan assembly comprising a plurality of propfan blades, each of said propfan blades having an aerofoil portion and a root portion, a rotatable annular hub structure having inner and outer walls and circumferentially spaced blade mountings, said blade mountings supporting said root portions of said propfan blades, said inner and outer walls and said blade mountings defining axial passages between adjacent blade mountings, said axial passages having inlets aligned with said chutes of the downstream end of said exhaust duct to enable alternate flows of exhaust gases and ambient air to flow through said passages in said rotatable annular hub structure and to exhaust the flows to atmosphere downstream of said propfan assembly whereby exhaust gas flow does not interfere with ambient air flow over said aerofoil portions of said propfan blades;
and means for rotating said propfan assembly from said power turbine, said means including a shaft and a reduction gearbox operatively connected to said rotatable annular hub structure.

4,488,400

POSITIVE DISPLACEMENT AIR DELIVERY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

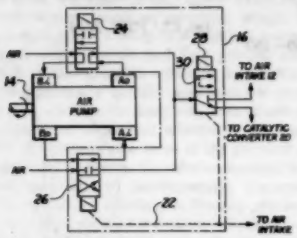
William C. Eddy, West Bloomfield, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Apr. 4, 1983, Ser. No. 481,609
Int. Cl.³ F01N *3/22*
U.S. Cl. 60—274 **29 Claims**

1. A positive displacement air delivery system for an internal combustion engine having an air intake supplying air to the engine, a catalytic converter, means for generating signals indicative of the operational state of said engine, and the catalytic converter, said air delivering system characterized by:
a positive displacement dual chamber rotary air pump mechanically driven by a rotary member of the engine, said air pump having a first pumping chamber having a first input port and a first output port and a second pumping

chamber having a second input port and a second output port; and

valve means interconnected with said first and second input ports and said first and second output ports, said valve means having a first state in response to a first signal connecting the air output from at least one of said first and



second pumping chambers to the catalytic converter, a second state in response to a second signal terminating the connection of the air output from said at least one pumping chamber to the catalytic converter and a third state in response to a third signal connecting the air output from said first and second chambers to the air intake supercharging the engine.

4,488,401

HYDRAULIC SERVO STEERING FOR VEHICLES

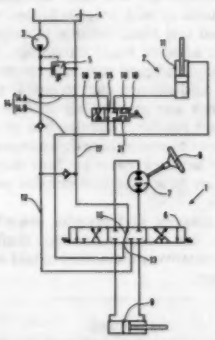
Werner Tischer, Böbingen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, A.G., Friedrichshafen, Fed. Rep. of Germany

Filed May 28, 1982, Ser. No. 382,934

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1981, 3124939

Int. Cl.³ F16D *31/02*

U.S. Cl. 60—384 **10 Claims**



1. In combination with a fluid servo steering system having a reservoir, a servo pump, a servo motor and a steering valve device responsive to displacement thereof from a neutral position for controlling preferential flow of pressurized fluid from the pump to the servo motor and exhaust of the fluid from the servo motor to the reservoir, an additional fluid operated motor and an on-off valve device connected to the pump in parallel with the steering valve device and displaceable from a neutral position thereof for supplying the pressurized fluid from the pump to the additional fluid operated motor, recirculating means (**14**) open only in the neutral position of both of the valve devices (**6, 10**) for conducting the fluid between the servo pump (**3**) and the reservoir (**4**) in bypass relation to the servo motor (**9**) and the additional fluid operated motor (**11**) while respectively blocking flow to and from said motors, the improvement comprising exhaust flow passages means (**14B, 16**) controlled by the steering valve device for conducting the fluid to the reservoir through a communication path from the additional fluid operated motor in response to said displacement of the on-off valve device from the neutral position, and valve passage means (**15**) in the on-off valve device open only in the netural position thereof for establishing fluid communication between the servo pump and the exhaust flow passage means, the steering valve device being displaceable from the neutral position to extreme operating positions in which the exhaust flow passage means is closed to block the return of the fluid through the communication path to the reservoir from the additional fluid operated motor.

4,488,402

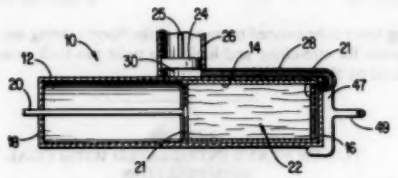
INTERNAL THERMAL EXCHANGER ENGINE

Charles A. Sieck, Riverhouse Apts. 2311 N. Front St., Harrisburg, Pa. 17110

Filed May 5, 1982, Ser. No. 375,172

Int. Cl.³ F02G *1/04*

U.S. Cl. 60—517 **14 Claims**



1. An internal thermal exchanger engine which provides increased efficiency of heat energy due to recycling of heat energy between a gas and exchanger material within a closed system, comprising: an enclosed chamber of generally uniform cross-section throughout its length and having first and second end portions and with a gas phase fluid enclosed therein; a heat exchanger located within said chamber, said heat exchanger being of a size and shape so as to fit inside the chamber with a close tolerance so that the outer walls of the exchanger are freely slideable in a longitudinal direction within the interior walls of the chamber, said heat exchanger containing a foraminous heat conductive material distributed throughout the entire volume of said heat exchanger, said heat exchanger having perforated end portions which allow said gas phase fluid to pass freely through said heat exchanger as said heat exchanger moves between the first and second end portions of the chamber; means for heating said first end portion of said chamber uniformly over said first end portion; means for operating said heat exchanger between the first and second end portions of the chamber; a working piston and cylinder unit; means for connecting said working piston and cylinder unit in fluid communication with said first end portion of said chamber, so that variations in pressure within said chamber are transmitted exteriorly from said first end portion to said piston; said heating means acting to heat the portion of said gas phase fluid which passes into said working piston and cylinder unit.

4,488,403

RECIPROCATING THERMAL ACTUATOR

John A. Barto, 3416 Croydon Rd., Baltimore, Md. 21207

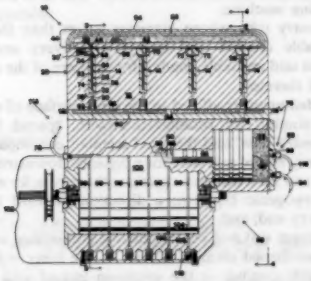
Filed Feb. 28, 1983, Ser. No. 470,578

Int. Cl.³ F03G *7/06*

U.S. Cl. 60—530 **11 Claims**

1. In a system for generating power, a first subsystem including: a housing (**16**) having therein a first bore portion (**30**), a gasket seal (**34**), an end plug (**68**), a thermal plate (**40**), a thermally insulative gasket (**58**), the first bore portion (**30**) ending

at said gasket seal (34), a second bore portion (30') coaxial with but smaller in diameter than the first bore portion (30) passing through the gasket seal (34) and end plug (68) and thermally insulative gasket (58) and ending in a blind end (48) within the thermal plate (40), a piston (28) having a first end (26) in the form of a uniform diameter reduced portion less in diameter than the first bore portion (30), the first end terminating in a free end (46) and fitting the second bore portion (30') in position for reciprocation of said free end (46) between the thermally insulative gasket (58) and the blind end (48) of the second bore portion (30') in the thermal plate (40), the piston (28) having a portion (28') of larger diameter than said first end (26) and a coaxial shoulder (32) between the first end (26) and the larger diameter portion (28'), a first liquid (22), said first liquid located in said first bore portion (30) around said first end (26) and being thermally expansible between said gasket seal (34) and coaxial shoulder (32) for moving said piston (28) in a first direction, a heater (36) located around said first bore portion (30) for heating said first liquid (22) and moving said piston (28)



in a second direction, opposite the first direction, said thermal plated (40) having coolant (42) associated therewith in position for cooling said thermal plate (40) and thereby cooling said first end (26) and first liquid (22) therearound to a greater extent when said free end (46) is in the thermal plate (40) than when said free end (46) is in said thermally insulative gasket (58), a piston head (62) associated with said larger diameter portion (28') of the piston (28), a second liquid (60) in a hydraulic reservoir (18) containing hydraulic fluid (60) in position for displacement by said piston head (62) upon thermal expansion of said first liquid (22), a dual double-acting piston (84) having a smaller diameter portion (86) and a larger diameter portion (90), a third liquid (89) contained at said larger diameter portion (90) of said dual double-acting piston (84), a conduit (78) connecting the hydraulic fluid (60) for actuation of said smaller diameter portion (86) upon said displacement of the hydraulic fluid (60) and thereby actuating said larger diameter portion (90) and displacing said third liquid (89), and a turbine system (102) connected for actuation by said displacement of said third liquid (89).

4,488,404

HYDRAULIC FLUID RESERVOIR FOR AUTOMOBILE

Susumu Arakawa, Chiryu; Tooru Tsukigahora, Toyota, and Akira Shirai, Toyoake, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidoshakogyo Kabushikikaisha, Toyota, both of, Japan

Filed Jun. 24, 1982, Ser. No. 391,836

Claims priority, application Japan, Jun. 26, 1981, 56-93881[U]

Int. Cl.³ B60T *17/22*; F15B *7/00*

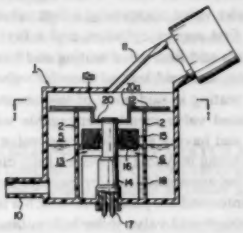
U.S. Cl. 60—535 **7 Claims**

1. A hydraulic fluid reservoir for an automobile including:

(a) a reservoir case including a wall portion and a top portion with an inlet defined in the top portion,

(b) a plurality of fluid chambers defined by a partition positioned within the reservoir case, each of said fluid chambers being in communication with separate hydraulic systems in the automobile,

(c) a float chamber being defined by the partition and extending from the bottom of the reservoir case so as to define an opening therein, the float chamber in communication with at least one of the fluid chambers wherein the partition for said fluid chambers and the float chamber defines a horizontal plane parallel to and vertically spaced from the top portion of the reservoir casing,



(d) a float guide extending from a bottom section of the reservoir case into said float chamber so as to receive a float thereon, and

(e) a substantially flat baffle plate positioned between an upper end of the partition and the inlet and defining a clearance from the upper end of the partition to substantially cover the opening of the fluid chamber and to define openings of predetermined ratio to the fluid chambers, said openings determining the flow rates of the fluid into the fluid chambers in cooperation with upper sections of the wall portion of the reservoir case.

4,488,405

MASTER CYLINDER ASSEMBLY FOR A VEHICLE HYDRAULIC BRAKING SYSTEM

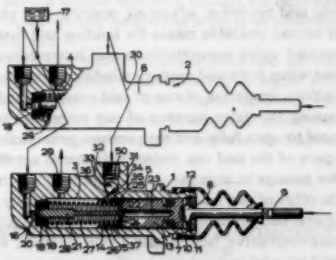
Anthony G. Price, Acocks Green, and Roy Campbell, Bromsgrove, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Sep. 28, 1981, Ser. No. 306,401

Claims priority, application United Kingdom, Oct. 2, 1980, 8031822; Mar. 6, 1981, 8107146

Int. Cl.³ F15B *7/00*

U.S. Cl. 60—581 **12 Claims**



1. A master cylinder assembly for a vehicle hydraulic braking system comprising first and second master cylinders adapted to be operated independently and simultaneously, each said master cylinder comprising a body having a longitudinal bore, a piston working in said bore and movable between a retracted position and an operative, advanced, position, a pressure space in said bore in advance of said piston for connection to a wheel brake, each said pressure space being pressurised when said respective master cylinder is operated to

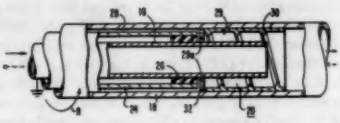
advance said piston in said bore and being unpressurised when said master cylinder is in an inoperative position with said piston in said retracted position, a transfer passage through which said pressure spaces are in communication when both said master cylinders are operated simultaneously, a first transfer valve located in said body of said first master cylinder between said transfer passage and said pressure space of said first master cylinder, and a second transfer valve located in said body of said second master cylinder between said transfer passage and said pressure space of said second master cylinder, said first transfer valve comprising a first valve seating in said body of said first master cylinder, and a first valve member engageable with said first valve seating and having a pressure-responsive face, and said second transfer valve comprising a second valve seating in said body of said second master cylinder and a second valve member engagable with said second valve seating and having a pressure-responsive face, each said transfer valve being movable between a fully closed position to prevent flow between said transfer passage and said pressure space and an intermediate position in which a limited flow can take place through said valve in both directions, and between said intermediate position and a fully open position, said valve member being urged into engagement with said seating in said fully closed position by pressure acting on said pressure-responsive face, said valve member being spaced from said seating by an amount sufficient to permit said limited flow in said intermediate position, and said valve member being spaced from said seating by an amount sufficient to permit an unrestricted flow through said valve in said fully open position, a first thrust member located between said piston of said first master cylinder and said first valve member of said first transfer valve, said first thrust member being spaced from said first valve member when said piston is in said retracted position but being adapted to co-operate with said first valve member to urge said first valve member positively away from said first valve seating to determine said fully open position of said first valve when said piston is urged into said operative, advanced, position, a second thrust member located between said piston of said second master cylinder and said second valve member of said second transfer valve, said second thrust member being spaced from said second valve member when said piston is in said retracted position but being adapted to co-operate with said second valve member to urge said second valve member positively away from said second valve seating to determine said fully open position of said second valve when said piston is urged into said operative, advanced, position, first yieldable means and second yieldable means for holding said first valve and said second valve respectively in said intermediate positions at least when both said master cylinders are in said inoperative positions, operation of one of said master cylinders on its own causing the valve member of said respective transfer valve thereof to open fully and the pressure generated in said pressure space of the said one master cylinder to act through said transfer passage to urge the valve member of said transfer valve of the other of said master cylinders into said fully closed position against said yieldable means by said pressure acting on said pressure-responsive face of said valve member, thereby isolating said transfer passage from said pressure space of said other, then inoperative, master cylinder, whereby said pressure space of the said one master cylinder can be pressurised with no fluid being transferred to the said other master cylinder, and simultaneous operation of both said master cylinders causing both said transfer valves to move into said fully open positions by co-operation of said first and second thrust members with said first and second valve members respectively, whereby both said pressure spaces are placed in open communication through said transfer passage.

4,488,406

COUPLING FOR CRYOGENIC LIQUID TRANSFER INTO ROTATING APPARATUS

Phillip W. Eckels, Penn Hills, Pa., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jan. 16, 1984, Ser. No. 571,261
Int. Cl.³ F17C 7/02
U.S. Cl. 62—55 **3 Claims**



1. A fluid transfer coupling, for introducing a cryogenic liquid into a rotating machine, comprising:

a rotatable conduit disposed for coaxial rotation with the rotating machine;

a stationary tube whose diameter is less than that of said rotatable conduit and having a delivery end located within said rotatable conduit for delivery of the cryogenic liquid thereto;

a threaded member affixed to the inner surface of said rotatable conduit for rotation therewith, spaced from said stationary tube, said threaded member encompassing said delivery end of said tube for a distance downstream therefrom and for a distance upstream therefrom for advancing the cryogenic liquid in a direction forward from said delivery end; and,

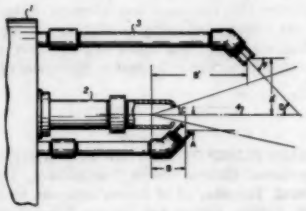
an upstream seal and bearing device comprising an annular washer-shaped element affixed to the inner wall of said rotatable conduit at the upstream end of said threaded member and having an inner diameter that is less than that of said threaded member for preventing movement of the cryogenic liquid upstream from said threaded member with the inner diameter surface of said washer-shaped element serving as a bearing surface for relative motion of said rotatable conduit and said stationary tube.

4,488,407

PROCESS FOR MAKING SLUSH

Mark A. Delano, White Plains, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 23, 1983, Ser. No. 478,148
Int. Cl.³ F25C 1/00
U.S. Cl. 62—74 **1 Claim**



1. A process for making slush comprising the following steps:

(a) delivering liquid cryogen in mid-air at a flow rate in the range of about 15 gpm to about 250 gpm and at a pressure in the range of about 2 psig to about 50 psig, the delivery being effected by a right circular cone-shaped spray wherein the hypothetical axis of the cone is horizontal or at a downward angle of about 1 to about 90 degrees from the horizontal;

(b) delivering a liquid to be slushed also in mid-air in a direction co-current with the liquid cryogen at a flow rate in the range of about 0.5 to about 5 times the flow rate of the liquid cryogen and at a pressure in the range of about 0.5 to about 2 times the pressure of the liquid cryogen, the delivery being effected by 1 to 5 sets of 2 to 8 right circular cone-shaped sprays per set wherein (i) the apex of each cone in a set is equidistant from the apex of each other cone in the set and from the axis referred to in step (a); (ii) the radial distance A measured from the axis referred to in step (a) to the apex of a cone in any set is in the range of about 0.5 to about 8 inches; (iii) the distance B measured along the axis referred to in step (a) from the apex of the cone referred to in step (a) to the point of intersection of a hypothetical radial line drawn from said axis to the apex of a cone in any set is in the range of about 0.5 to about 12 inches; and (iv) the value of A or B is selected for each set and the unselected value of A or B for said set is determined in accordance with step (c); and

(c) determining the value of the unselected A or B for the set referred to in step (b) (iv) in accordance with the following equation:

$$A = \text{about } B \text{ times } \tan C \left\{ \sin D \left[\left(\frac{\sin[180(1 - 1/E) - F]}{\sin F} \right)^{-1} \right]^{+1} \right\}$$

wherein:

A and B are defined as in step (b), above

C=one half of the spray angle of the spray referred to in step (a)

D=the acute angle formed by the axis referred to in step (a) and the hypothetical axis of any cone in the set

E=the number of sprays selected for the set

F=one half of the spray angle of any spray in the set provided, however, in the event that the value of A or B as determined by the equation is outside of the ranges therefor set forth in step (b), then, the value of A or B shall be the value set forth in step (b), which is closest to the value determined therefor by the equation.

4,488,408

COOLING METHOD AND SYSTEM THEREFOR

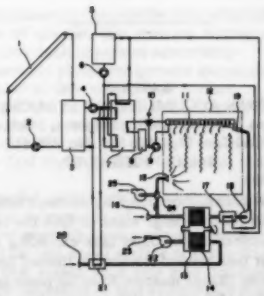
Senri Kajitsuka, Kodaira, Japan, assignor to Taikisha Ltd., Tokyo, Japan

Filed Oct. 27, 1982, Ser. No. 436,901

Claims priority, application Japan, Oct. 30, 1981, 56-175292

Int. Cl.³ F25B *41/00*

U.S. Cl. 62—113 **15 Claims**



1. A cooling method comprising:

removing sensible heat from a cooling load including air in a room by cooling means (11) having cooling surfaces in said room to be cooled, by receiving and circulating within said cooling means a circulating cooling medium evaporated in an absorption refrigerator (7) utilizing a heating medium, said circulating cooling medium being received from said absorption refrigerator;

dehumidifying said air by circulating said air through a dry type dehumidifier (13); utilizing said heating medium to regenerate the dehumidifying function of said dry type dehumidifier; and

blowing the resulting dehumidified air on said cooling surfaces of said cooling means (11) in a direction substantially parallel to said cooling surfaces, whereby the formation of condensate on said cooling surfaces is avoided.

4,488,409

TROUBLE DIAGNOSING APPARATUS FOR AN AUTOMOBILE AIR CONDITIONER

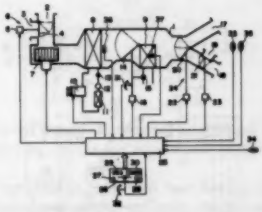
Toshizo Hara, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Aug. 30, 1983, Ser. No. 527,735

Claims priority, application Japan, Sep. 11, 1982, 57-158540

Int. Cl.³ F25B *49/00*

U.S. Cl. 62—127 **5 Claims**



1. In an air conditioner for an automobile having an air distribution changeover means for electrically changing over a distribution condition of air passing through a duct means, and having an electric control means for electrically controlling the air conditioner of an automobile, a trouble diagnosing apparatus comprising:

trouble diagnosing areas located at a plurality of portions of said electric control means;

a plurality of trouble detecting circuits for detecting a trouble at said trouble diagnosing areas as an electrical trouble signal; and

a drive control means for controlling said air distribution changeover means when said trouble signal is outputted from at least one of said trouble detecting circuit and causing it to be in a predetermined air distribution condition in correspondence with said trouble diagnosing area having a detected trouble.

4,488,410

CONTROL APPARATUS FOR AUTOMOTIVE AIR CONDITIONER

Abe Selderman, 7365 SW. 132nd St., Miami, Fla. 33156

Division of Ser. No. 169,994, Jul. 18, 1980, abandoned. This application Sep. 16, 1981, Ser. No. 302,771

Int. Cl.³ B60H *3/04*; F25B *27/00*

U.S. Cl. 62—133 **7 Claims**

1. On an automotive vehicle having an engine, a transmission, a gear shift lever for shifting said transmission, a clutch pedal, and an air conditioner, the improvement which comprises:

control means operable in response to the actuation of said gear shift lever and independent of the acceleration of the

vehicle for maintaining the air conditioner off while the transmission is being shifted through the lower gears and

for turning on the air conditioner after the transmission is shifted into high gear.

4,488,411

IDLE SPEED CONTROL APPARATUS

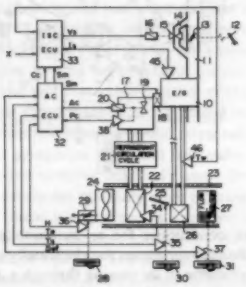
Kiyoshi Hara, Oobu, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 15, 1983, Ser. No. 504,427

Claims priority, application Japan, Jun. 16, 1982, 57-104183

Int. Cl.³ B60H *3/04*; F25B *27/00*

U.S. Cl. 62—133 **3 Claims**



1. An idle speed control apparatus for an automotive vehicle internal combustion engine adapted to drive a refrigerant compressor of a vehicle compartment air conditioner comprising:

first adjusting means for adjusting an idle speed of said engine;

second adjusting means for adjusting a refrigerant delivery capacity per operating stroke of said compressor; and

an electric control block for electrically controlling said second adjusting means and electrically controlling said first adjusting means in cooperation with said first-mentioned control operation, said electric control block comprising:

first detecting means for detecting an operating condition of said engine;

second detecting means for detecting a condition for a first load comprising said compressor;

third detecting means for detecting a condition of a second load other than said compressor;

means for generating an idle control signal when total engine load represented by outputs from said first, second and third detecting means exceeds a predetermined load threshold;

means responsive to said compressor adjusted to a desired refrigerant delivery condition and said second detecting means to generate a desired cooling control signal;

means responsive to said cooling signal exceeding a predetermined value to generate a compressor drive signal; and

means responsive to said drive signal to control the application of said cooling control voltage to said idle control signal generating means.

4,488,412

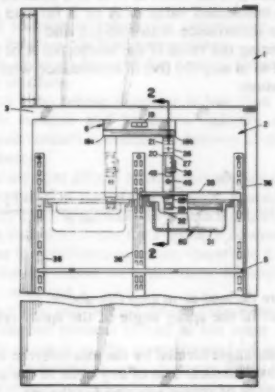
ADJUSTABLE AIR DUCT FOR A MEAT KEEPER

Douglas E. Weaver, Greenville, and Ralph W. Brown, II, Orleans, both of Mich., assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Nov. 14, 1983, Ser. No. 551,335

Int. Cl.³ F25D *25/02*

U.S. Cl. 62—382 **12 Claims**



1. A meat keeper compartment in a refrigerator having a freezer compartment and a separate fresh food compartment comprising:

a meat keeper receptacle;

means for mounting the meat keeper receptacle at different laterally spaced positions within the fresh food compartment;

a duct in said fresh food compartment channelling cold air from the freezer compartment into the meat keeper receptacle; and

means to mount said air duct at different laterally spaced positions in said fresh food compartment corresponding to said different lateral positions of the meat keeper receptacle.

4,488,413

SUCTION ACCUMULATOR STRUCTURE

Edward Bottum, 525 N. Fifth St., Brighton, Mich. 48116

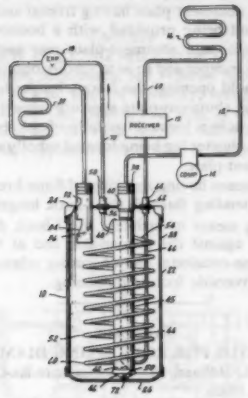
Filed Jan. 17, 1983, Ser. No. 458,617

Int. Cl.³ F25B *43/00*

U.S. Cl. 62—503 **8 Claims**

1. A suction accumulator including an outer tank, means for passing gaseous phase change material into the outer tank, a suction tube secured to the outer tank extending through the top of the outer tank toward the bottom thereof for withdrawing gaseous phase change material from the outer tank adjacent the top thereof and for passing the gaseous phase change material out of the outer tank, a hollow coil spaced between the inside of the body and the suction tube and means for passing a heated heat transfer material into the coil at the bottom of the

suction tube and out of the coil at the top of the suction tube completely through the coil whereby liquid phase change



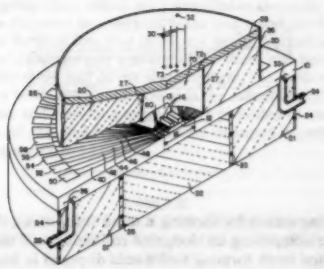
material in the accumulator is vaporized prior to passage out of the outer tank.

4,488,414

DISC DETECTOR ASSEMBLY

David L. Jungkman, Hudson, N.H.; Roger C. Coda, Harvard, and Peter N. Nicholson, Dracut, both of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 3, 1983, Ser. No. 538,384
Int. Cl.³ F25B *19/00*
U.S. Cl. 62—514 R **14 Claims**



1. An infrared energy receiver for measuring infrared energy from a scene of interest, said receiver having a refrigerator dewar apparatus, such apparatus comprising:

A. a substantially planar refrigerator means comprising:
(i) an upper surface and a lower surface,
(ii) an input gas port and an exhaust gas port,
(iii) means for channeling and expanding pressurized gas between said input gas port and said exhaust port such that a first region of said refrigerator means is cooled, and
(iv) a second region which remains substantially at the ambient temperature of said infrared energy receiver;

B. a detector assembly having one or more detector elements mounted on said upper surface of said refrigerator means in said first region such that said detector assembly is cooled by operation of said refrigerator means;

C. an electrically conductive pattern applied to said upper surface of said refrigerator means, said pattern having contact pads attached in said second region of said refrigerator means and said pattern having electrical leads to provide electrical connection from said detector elements of said detector assembly to said contact pads;

D. insulation means positioned with respect to said refrigerator means such that said first region is thermally separated from said second region, said insulation means shaped such that energy entering said receiver from said scene of interest may be collected and measured by said detector assembly; and

E. an optical window covering said first region such that energy of the desired waveband from said scene of interest may enter said chamber to be collected and measured by said detector assembly.

4,488,415

RING WITH REPLACEABLE STONES

Mary A. Jenkins, 364 Timberlane Dr., Gretna, La. 70053

Continuation-in-part of Ser. No. 477,153, Mar. 21, 1983,. This application Oct. 12, 1983, Ser. No. 541,043
Int. Cl.³ A44C *17/02*
U.S. Cl. 63—29 R **1 Claim**

1. An improved article of personal adornment comprising:

(a) a base having means for attachment of the article to a person;

(b) a bezel upstanding from said base having an essentially flat, extended top arising vertically therefrom;

(c) a clamping lid hingedly affixed to said bezel to one side thereof and being geometrically similar to said bezel;

(d) fixed stone mounting means exteriorly mounted about said clamping lid for nonremovably mounting a contiguous array of stones about the clamping lid;

(e) a plurality of interchangeable stones of decorative appearance sizably adapted to and geometrically similar to the bezel; and

(f) clasp means one component of which is a pivoted latch plate having a slotted opening through which a projection upstanding from said bezel passes and a secondary clasp means having at least one projection upstanding from said bezel base adapted to snap fit between adjacent fixed stones mounted about said clamping lid to securely affix the lid to the bezel base to retain the interchangeable stone in place.

4,488,416

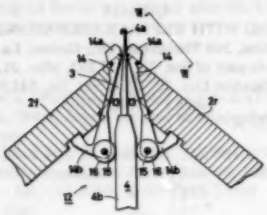
SET-UP MEANS IN A FLAT KNITTING MACHINE

Masahiro Shima, and Hirozi Nishida, both of Wakayama, Japan, assignors to Shima Idea Center Co. Ltd., Wakayama, Japan

Filed Apr. 1, 1983, Ser. No. 481,260
Claims priority, application Japan, Apr. 15, 1982, 57-62982
Int. Cl.³ D04B *15/88*
U.S. Cl. 66—149 R **5 Claims**

1. Set-up means in a flat knitting machine having a pair of needle beds arranged in an inverted V shape comprising: a set-up comb having a plurality of tooth members, each shaped like a hook at the upper end thereof, said set-up comb being up and down movably disposed beneath a gap between the needle beds so that the upper ends of said tooth members extend beyond said gap when the set-up comb is elevated to the upper extreme, drive means for up-and-down movement of said set-up comb, a knockover plate disposed under the needle beds

and supported between side frames of the machine and on the back side of said tooth-end hooks of the set-up comb, said knockover plate having an operative portion displaceable between a retreated position at which said plate may not interfere with the up-and-down movement of said set-up comb and an advanced position at which said plate is able to press the knitted fabric engaged by said set-up comb at its lowered position from the back side of the tooth-end hooks of said comb, drive means for displacing said operative portion of said knockover plate and a pair of guide means projecting from the underside of the pair of needle beds at front portions thereof so that said tooth members may be guided and supported in position within said gap between the needle beds as they pass



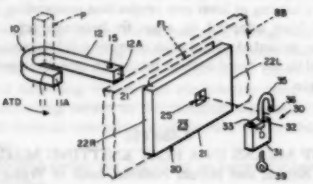
therethrough, said guide means comprising extensions to the lower ends of a plurality of knockover-comb plate members constituting a knockover comb and fixed to each of the needle beds at the front end portion thereof, said extensions each extending to the underside of the needle beds, a pin extending through each set of said knockover-comb plate members via holes formed in said plate members at the lower ends thereof, and a plurality of rollers rotatably arranged on said pin between said individual knockover-comb plate members, whereby when said set-up comb is at its elevated position, the base portion thereof on which the tooth members are arranged is up and down movably supported by and between said pair of guide means.

4,488,417

ANTI-THEFT DEVICES FOR PARKED TRACTOR VEHICLES

Clarence L. Werner, 11806 Adams Plz., Omaha, Nebr. 68137

Filed Dec. 10, 1982, Ser. No. 448,597
Int. Cl.³ E05B 65/12
U.S. Cl. 70—253 **9 Claims**



1. In combination with a cab-over-engine type tractor vehicle wherein its vertical steering column carries a co-turnable and radially-offset pitman-arm that is pivotally connected to linkage to effect steering of the tractor through driverside roadway wheel, and wherein the tractor has an upright frontal bumper frontally disposed of the pitman-arm and having a driverside foot-hold opening in horizontal registry with the pitman-arm whenever the steering wheel is turned in the direction of the driverside roadway wheel, the improvement of a tractor anti-theft device for a tractor parked in the condition where the steering wheel has brought the pitman-arm in horizontal registry with said bumper foot-hold opening, and said anti-theft device thereat comprising:

A. a horizontally extending J-hook extending through the driverside foot-hold opening and engaged with the pitman-arm, said J-hook adjacent the free-end terminus of the longer leg being provided with a hole therethrough;

B. a vertical abutment-plate having frontal and rear upright surfaces and being provided with a horizontal aperture therethrough, said abutment-plate rear surface abutting against the bumper and so as to wholly obscure the driverside foot-hold opening, the J-hook longer leg protruding through the abutment-plate aperture whereby the J-hook longer leg hole is located frontally of the abutment-plate, the J-hook shorter leg being located wholly rearwardly of the abutment-plate;

C. padlock means having a shackle of finite-breadth and said shackle extending through the J-hook longer leg; and

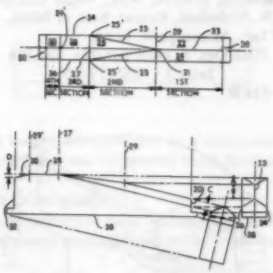
D. steadying means to maintain the J-hook drawn tightly forwardly against the pitman-arm and at the abutment plate in non-rotational and obscuring relationship at the bumper driverside foot-hold opening.

4,488,418

APPARATUS FOR ROLL SIZING DIAMETERS

Paul Fitzpatrick, Holland, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Mar. 11, 1982, Ser. No. 356,986
Int. Cl.³ B21H 1/18
U.S. Cl. 72—88 **6 Claims**



6. Tooling means for forming a tooth form on a cylindrical workpiece comprising an elongated roll sizing tool means and an elongated tooth forming tool means disposed in line so that the workpiece contacts the roll sizing tool means to size the diameter thereof about equal to the pitch diameter appropriate for the teeth to be formed therein and then contacts the tooth forming tool means to form the tooth form in the roll sized workpiece, said roll sizing tool means including an elongated body having longitudinal axis and leading and trailing ends, a working surface between said ends, a base between said ends spaced and facing oppositely from the working surface and defining a base plane, longitudinal sides facing oppositely from one another and extending from the base to the working surface, said working surface being between said sides and leading end and trailing end, said working surface having a first section between the leading end and trailing end with a transversely crowned surface extending between said sides sloping toward the base plane in opposite transverse directions to said sides and sloping longitudinally toward the base plane in the direction of the leading end at a first angle relative to the base plane, a second section between the first section and trailing end with a diverging surface increasing in width in the longitudinal direction toward the trailing end and sloping longitudinally toward the base plane in the direction of the leading end at a

second angle relative to the base plane less than the first angle, and a third section between the second section and trailing end with a sizing surface substantially parallel with said base plane extending between said sides.

4,488,419

SKEW ROLLING MILL FOR TUBES

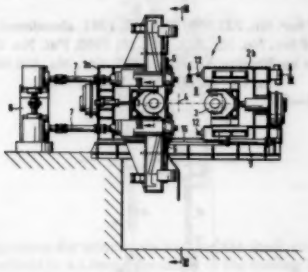
Albert Quambusch, Meerbusch, and Wilfried Schöneberg, Düsseldorf, both of Fed. Rep. of Germany, assignors to Kocks Technik GmbH & Co., Hilden, Fed. Rep. of Germany

Filed Jul. 21, 1982, Ser. No. 400,478

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1981, 3132712

Int. Cl.³ B21B *31/08*

U.S. Cl. 72—95 **24 Claims**



1. A skew rolling mill for tubes, having a stand upright in two parts which are laterally separable along a substantially vertical parting line, one part being fixed and the other movable horizontally transverse to a pass line through said mill a pair of driven skew rolls which are journalled adjacent to one another so as to be inclined relative to the pass line, and a pair of driven guide discs which are journalled in the stand upright so as to be disposed in a vertical plane and respectively above and below the pass line, one skew roll being journalled in one part of the stand upright and the other skew roll being journalled in the other part of the stand upright, the skew rolls and guide discs being removable towards the substantially vertical parting line, and clamping means being provided to enable the two parts of the stand upright to be clamped together in a play-free manner.

4,488,420

PROCESS AND APPLIANCE FOR FEEDING MATERIAL TO HOT AND SEMI-COLD METAL-WORKING MACHINES

Roger Criblez, Bottmingen, Switzerland, and Raymond Schoenenberger, Rosenau, France, assignors to Hatebur Umformmaschinen AG, Reinach, Switzerland

Filed Jul. 22, 1982, Ser. No. 400,847

Claims priority, application Switzerland, Aug. 14, 1981, 5270/81

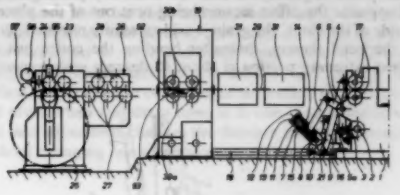
Int. Cl.³ B21K *29/00*

U.S. Cl. 72—128 **11 Claims**

1. A device for feeding material in the form of a coil of wire from a fixture for receiving and rotating said coil of wire through a straightening apparatus and a heating station to a hot and semi-cold metal-working machine in an intermittent manner comprising

a cold feeding fixture located upstream of said heating station with one or more pairs of feed rollers, which act on the cold wire with its full contact pressure over a major portion of each individual stroke to pull said wire from said coil and through said straightening apparatus, and with an at least reduced contact pressure over the remaining portion of said stroke,

a hot-feeding fixture located downstream of said heating station with at least one pair of feed rollers, which act on the hot wire over said remaining portion of each stroke with a predetermined low contact pressure to feed and



urge said hot wire against a stop of said metal-working machine and

adjustable link means for driving both feeding fixtures in functional synchronism with said metal-working machine.

4,488,421

MANDREL-CARRIER HEAD FOR A RESTRAINED-MANDREL CONTINUOUS ROLLING MILL

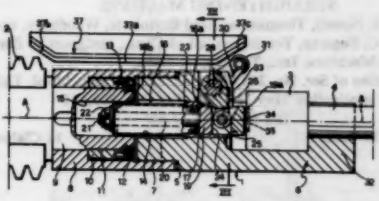
Giorgio Quecchia, Corsico, and Filippo Cattaneo, Milan, both of Italy, assignors to Innse Innocenti Santeustacchio S.p.A., Brescia, Italy

Filed Jun. 15, 1983, Ser. No. 504,673

Claims priority, application Italy, Jun. 17, 1982, 21913 A/82

Int. Cl.³ B21B *17/10*

U.S. Cl. 72—208 **6 Claims**



1. A mandrel-carrier head for a restrained-mandrel continuous rolling mill, comprising an essentially horizontal hook portion engageable with the tail of said mandrel and having a U-section which is widened in a direction parallel to the rolling axis of the mill and has limbs of different lengths, wherein at least one part of at least one of said limbs is movable on the hook portion towards and away from the other said limb, and an actuator member is provided for the guided displacement of said at least one movable part of said at least one limb.

4,488,422

METHOD OF MAKING FORKS FOR FORK LIFT TRUCKS

Theodore L. Wolf, Chardon; John A. Rossman, Strongsville; Russell C. Quinn, Twinsburg, and Thomas J. Kish, Mentor, all of Ohio, assignors to Jos. Dyson and Sons, Inc., Eastlake, Ohio

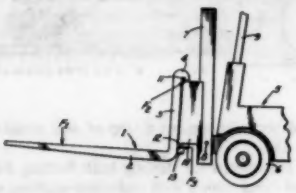
Continuation-in-part of Ser. No. 889,431, Mar. 23, 1978, Pat. No. 4,426,188. This application Feb. 17, 1983, Ser. No. 467,442

Int. Cl.³ B21K *1/72*

U.S. Cl. 72—377 **3 Claims**

1. The method of making a fork having load and support arms, for a fork lift vehicle from a fork body blank formed of material having a distinctive grain extending longitudinally throughout, subject to flow upon manipulation of such material, which manipulation comprises heating an elongated fork

blank at one end which will ultimately constitute a head, to forging temperature, applying gathering forming pressure to said end to produce an angularly offset section, including a reverse bend, with the grain therein extending continuously linearily and angularly therein, the extremity portion of said end opposite the offset section being bent out of the plane of the side of the blank, the grain in said extremity portion following the bend therein, thereafter bending the entire just described extremity portion at about 45 degrees with respect to



said body to form the end of the extremity portion of the fork being formed, and thereafter bending and forming the end of the extremity portion to include a desired contour by application of forging pressure thereto, said forming and bending causing the offset section to move into substantially parallel position to the body of the blank, creating a hook-shaped form for the end now comprising a head and a downwardly open groove across the width thereof, the grain in said offset section thereby aligning completely with the exterior contour desired in the fork formed thereby.

4,488,423

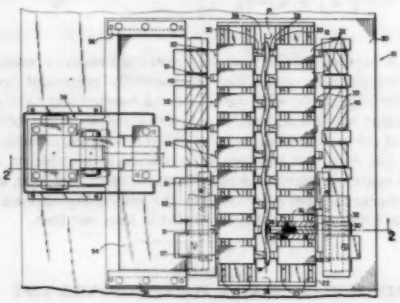
STRAIGHTENING MACHINE

Burtram I. Newell, Thomaston; Reed Bertolette, Woodbury, and Bruce C. Fogarty, Torrington, all of Conn., assignors to Bertolette Machines, Inc., Torrington, Conn.

Continuation of Ser. No. 213,873, Dec. 8, 1980, abandoned. This application May 31, 1983, Ser. No. 499,411

Int. Cl.³ B21D *1/00*

U.S. Cl. 72—385 **16 Claims**



1. A machine for straightening an elongated workpiece comprising at least three sets of coacting tools including first and second sets of tools arranged in alternate series along a fixed longitudinal axis to engage successive longitudinally space portions of a workpiece positioned in said machine with its longitudinal center line generally aligned with said longitudinal axis, each of said sets including two transversely opposed tools having transversely spaced work engaging surfaces engageable with transversely opposite sides of the workpiece when said tools are in working position, operating means for simultaneously reciprocating said first and second sets of tools a plurality of times within a working cycle and in opposite transverse directions relative to said longitudinal axis and each other to alternately displace portions of the center line of the workpiece to one and the opposite side of said longitudinal axis, means for varying the magnitude of said reciprocating movement to vary the magnitude of center line displacement between a position of maximum center line displacement and a position wherein the workpiece portions are substantially longitudinally aligned, and means for simultaneously moving said tools of each of said sets in unison relative to and away from each other from said working position to a workpiece receiving position, said tools of each of said sets being normally maintained in said working position by said operating means.

4,488,424

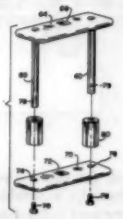
PULLER AND CABLE BENDER EMPLOYING SOCKET WRENCH MEANS

Thomas D. McBride, 559 Chestnut St., Westwood P.O., N.J. 07675

Division of Ser. No. 322,959, Nov. 19, 1981, abandoned, which is a division of Ser. No. 158,322, Jun. 10, 1980, Pat. No. 4,315,422. This application May 20, 1983, Ser. No. 496,601

Int. Cl.³ B21D *9/05;* **B21J** *13/08*

U.S. Cl. 72—387 **4 Claims**



1. Apparatus for bending and/or pulling tubing, cable and the like, said apparatus actuated by two ratchet wrench handles and including:

(a) an end plate having a drive means provided therewith and adapted to receive and be moved by ratchet wrench;

(b) a pair of rods secured to this end plate and movable therewith;

(c) a second end plate also having a drive means provided therewith and adapted to receive and be moved by a ratchet wrench, said second end plate having apertures therein adapted to mate with the pair of rods;

(d) means for securing said rods to the second end plate when desired, and

(e) a bushing of selected diameter rotatably mountable on each rod to assist in sizing the bending and/or pulling when the apparatus is turned by ratchet wrenches.

4,488,425

BENDING TOOL

David Meikle, 14 Paradise Rd., Burpengary, Queensland, Australia (4505)

PCT No. PCT/AU81/00155, § 371 Date Jun. 16, 1982, § 102(e) Date Jun. 16, 1982, PCT Pub. No. WO82/01486, PCT Pub. Date May 13, 1982

PCT Filed Oct. 28, 1981, Ser. No. 395,052

Claims priority, application Australia, Oct. 28, 1980, PE241

Int. Cl.³ B21D *31/00*

U.S. Cl. 72—389 **5 Claims**

1. A bending tool for bending elongate members including;

an elongated support frame;

an abutment block attached to said support frame;

a pusher member movably mounted to the support frame, said pusher member having a working end surface and a mounting end having a mating bore;

a pair of opposed recesses, for positioning a workpiece trans-

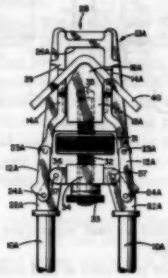
versely with respect to the support frame, located on opposite sides of the support frame;

a pair of handles;

linkage means interconnecting each handle to the support frame;

a longitudinal shaft screw threadedly mounted in said mating bore and extending parallel to the length of the support frame whereby said pusher member is adjustably movable, by said shaft screw, relative to the abutment block;

pivot means interconnecting said shaft screw to each of said handles; and



locking means for selectively locking the shaft screw against movement in a selected position in the mating bore of the pusher member;

the construction and arrangement being such that upon movement of said handles toward and away from each other said pusher block moves longitudinally with respect to said support frame relative to the abutment block and when an elongate member is located in said recesses and transversely of the support frame and interposed between the pusher member and the abutment block said longitudinal movement of the pusher member bends said elongate member and upon release of said locking means said pusher member may be adjustably moved on said shaft relative to the abutment block.

4,488,426

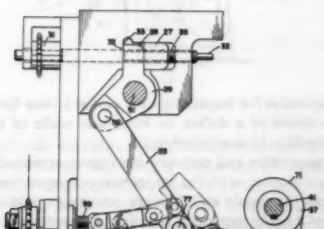
FORGING MACHINE FOR PRODUCING RIVETS OR THE LIKE HAVING RUNNING ADJUSTMENTS

Robert E. Wisebaker, Tiffin, Ohio, assignor to The National Machinery Company, Tiffin, Ohio

Division of Ser. No. 178,178, Aug. 14, 1980, Pat. No. 4,395,899. This application May 20, 1983, Ser. No. 496,422

Int. Cl.³ B21J *15/18*

U.S. Cl. 72—450 **9 Claims**



1. A tool drive for forging machines comprising a frame, a first drive lever pivoted on said frame powered to move between first and second predetermined positions, said lever being provided with a curved drive surface, and a linkage driven by said drive lever connected to move a tool, said linkage including a drive link having a pivot at one end and engaging said curved drive surface at its other end, movement of said drive lever between said positions causing corresponding movement of said pivot to drive said tool, and an adjustment connected to move said other end along said surface to adjust the distance said pivot is moved, said curved drive surface having a center of curvature coincident with the axis of said pivot when said drive lever is in one of said positions so that said adjustment changes the distance said pivot is moved without changing one extreme position thereof.

4,488,427

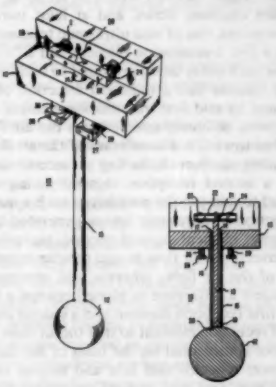
ROTATIONAL VIBRATORY VISCOMETER TRANSDUCER AND CIRCUIT

Frank J. Matusik, Piscataway, and Donald W. Nelson, Voorhees, both of N.J., assignors to National Metal and Refining Company, Ltd., Edison, N.J.

Filed Apr. 8, 1983, Ser. No. 483,142

Int. Cl.³ G01N *11/16*

U.S. Cl. 73—59 **20 Claims**



1. A transducer assembly for a torsional mode rotational vibratory viscometer, comprising:

a metal support plate having opposed lower and upper surfaces and a hole extending through the plate from said lower surface to said upper surface;

a hollow cylindrical metal sheath having torsional elasticity, the outer surface of an upper end part of said sheath extending through said hole from said upper surface to said lower surface and protruding from said lower surface, said sheath being secured to said plate at said hole by metal welds at both of said surfaces, so that said sheath is substantially coaxial with said hole;

an immersible tip member secured to a lower end part of said sheath below said plate;

a rigid cylindrical metal rod disposed within, spaced from and substantially coaxial with said sheath, a lower end part of said rod being secured to the lower end part of said sheath by a metal weld;

said rod extending through said hole and having an upper end above said plate; and

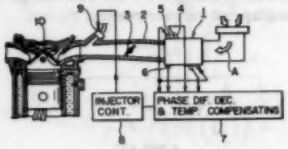
a metal crossbar secured to the upper end of said rod, said crossbar comprising magnetically permeable means.

4,488,428

ULTRASONIC AIR FLOWMETER FOR MOTOR VEHICLES

Kazuman Taniuchi, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 7, 1982, Ser. No. 396,173
Claims priority, application Japan, Jul. 7, 1981, 56-105861
Int. Cl.³ G01F *1/66*
U.S. Cl. 73—118.2 **2 Claims**



1. An ultrasonic air flowmeter for internal combustion engine of a motor vehicle comprising: a seonsor unit provided to an intake passage having one end vented to an atmosphere and the other end communicating with a combustion chamber of said engine; and a processing circuit for processing output signals of said sensor unit to measure an air flow rate wherein said sensor unit comprises a tubular member having a predetermined sectional shape through which an air to be supplied to the combustion chamber flows, and at least two ultrasonic transmitter-receivers, one of said ultrasonic transmitter-receivers including a first transmission element and a first reception element facing each other being provided to said tubular member in such a manner that a radiation direction of ultrasonic waves generated by said first transmission element to said first reception element obliquely intersections the air flow in said tubular member toward a downstream of the air flow and the other transmitter-receiver including a second transmission element and a second reception element facing each other being provided to said tubular member in such a manner that a radiation direction of ultrasonic waves generated by said second transmission element to said second reception element obliquely intersects the air flow in said tubular member toward an upstream of the air flow, wherein said processing circuit operates to detect a difference in phase between a first output signal of said first reception element and a second output signal of said second reception element so that the air flow rate in said tubular member is measured on the basis of the thus detected phase difference; wherein said first and second transmission elements and said first and second reception elements are provided at apertures on an outer surface of said tubular member and communicate with the interior of said tubular member through screen dome shields which are mounted in the apertures by means of elliptical rings, wherein said first transmission element and said second reception element are juxtaposed each other under a first common cover having an interior surface lined with sound-absorbing material; and wherein said second transmission element and said first reception element are juxtaposed each other under a second common cover having an interior surface lined with sound-absorbing material.

4,488,429

METHOD AND APPARATUS FOR MEASURING INJECTION AMOUNT OF FUEL INJECTOR

Shinzo Ito, Aichi, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

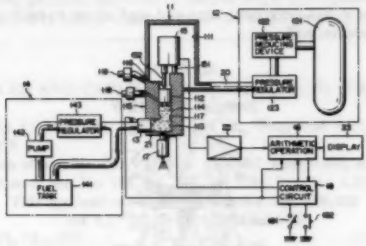
Filed Nov. 3, 1982, Ser. No. 438,723
Claims priority, application Japan, Nov. 4, 1981, 56-176857
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—119 A **19 Claims**

15. A method for measuring an injection amount of fuel injected by a fuel injector, comprising the steps of:

filling with a liquid fuel a measuring chamber which is provided with an injector, where the amount of the fuel injected is to be measured, and defined by a displacement member;

sealing a fuel passage to said measuring chamber, when said measuring chamber is filled with said liquid fuel, so as to prevent further supply of fuel;

applying pressure of a gas upon said displacement member which defines said measuring chamber, so that the liquid



fuel which is filled in said measuring chamber may act upon said injector;

causing said injector provided at said measuring chamber to perform a fuel injection operation so that the fuel in said measuring chamber is forced out from the chamber; and

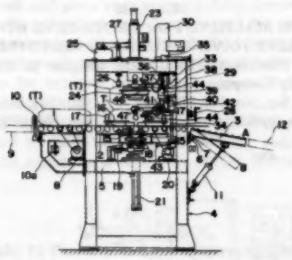
detecting the amount of displacement of said displacement member as the fuel is forced out from said measuring chamber, thereby determining the outflow amount of fuel.

4,488,430

TIRE INSPECTING APPARATUS

Mitsuru Fujimoto; Yoshiharu Shima; Hironobu Motooka, all of Shirakawa, and Minoru Kikuchi, Fukushima, all of Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Filed Jun. 29, 1982, Ser. No. 393,342
Claims priority, application Japan, Jun. 30, 1981, 56-103610
Int. Cl.³ G01M *17/02*
U.S. Cl. 73—146 **4 Claims**



1. An apparatus for inspecting tires one at a time for detecting the presence of a defect on both side walls of the tire, which comprises, in combination:

supply, inspection and delivery conveyors arranged in line with each other with the inspection conveyor positioned between the supply and delivery conveyors, said delivery conveyor being supported for pivotal movement between a delivery position and an eject position;

means positioned above the inspection conveyor for centering the tire, which has been transferred onto the inspection conveyor from the supply conveyor, to allow the tire to assume a predetermined position;

a movable rim mechanism including a lower rim supported for movement between lowered and lifted positions, and

an upper rim aligned coaxially with and in face-to-face relation to the lower rim, said tire at said predetermined position resting on the lower rim and adapted to be air-tightly sandwiched between the lower and upper rims when the lower rim is moved to the lifted position;

means coupled to the upper rim for rotating the tire together with the lower and upper rims in a horizontal plane perpendicular to the direction of movement of the lower rim;

a generally elongated lower carriage supported for movement in a direction parallel to the axis of rotation of the tire and also for pivotal movement in a plane parallel to said horizontal plane;

a generally elongated upper carriage supported for movement in a direction parallel to the axis of rotation of the tire and extending towards a position immediately above one of the opposite side walls of the tire;

a first sensing means mounted on the lower carriage, said first sensing means contacting under pressure the other of the opposite side wall surfaces of the tire when said lower carriage is moved close to the tire while pivoted to a position immediately below said other of the opposite side wall;

a second sensing means mounted on the upper carriage and adapted to contact said one of the opposite side walls of the tire when said upper carriage is lowered close to the tire; and

means responsive to any one of the first and second sensing means for generating an electric signal indicative of the presence of at least one projecting indent on the respective side wall surface of the tire.

4,488,431

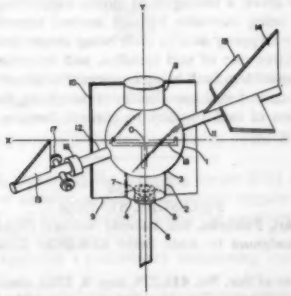
WIND SPEED AND DIRECTION INDICATOR AND ELECTRIC CURRENT GENERATING MEANS

Frank W. Miga, 8007 Carey Branch Dr., Fort Washington, Md. 20744

Continuation of Ser. No. 175,736, Aug. 6, 1980,. This application Jun. 2, 1982, Ser. No. 384,341

Int. Cl.³ G01W *1/04, 1/02*

U.S. Cl. 73—189 **9 Claims**



1. Spherically rotatable wind direction indicator comprising a support structure including a supported pivotable hollow cylindrical bearing cup means (2) with a wind force responsive and indicating means comprising an independent rotatable transparent hollow sphere (1), nestled within said bearing cup means (2) and with attached rod support means (11 and 12) for supporting a directional rudder (13) and wind type elevating means (14) and a weight balancing means (16 and 17) for balancing the rudder and wing type elevating means along imaginary horizontal and vertical axes, said rotatable transparent sphere being independently rotatable in movement regardless of the mounting of said sphere within the support structure.

4,488,432

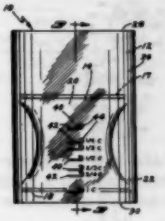
MEASURING CUP

Judith M. Bang, 5116 W. 60th St., Minneapolis, Minn. 55436

Filed Jun. 20, 1983, Ser. No. 505,959

Int. Cl.³ G01F *19/00*

U.S. Cl. 73—429 **13 Claims**



1. A measuring cup adjustable to measure a finite number of predetermined volumes of material, said measuring cup including:

A. an open ended cylinder;

B. a metering piston mounted in the cylinder for longitudinal movement and at least limited rotational movement with respect to the cylinder;

C. said cylinder being partially defined by an inner cylindrical surface and a plane, flat, discoidal upper edge surface perpendicular to the axis of the cylindrical surface;

D. said piston including:

(1) an upper, completely cylindrical measuring disc of diameter to contact the inner cylindrical surface of the cylinder when installed therein, said upper disc being provided with a plane, flat upper face,

(2) a lower interrupted cylindrical guide disc in sufficient contacting relation to the inner surface of the cylinder when installed therein to maintain the upper face of the upper measuring disc in normal relation to the axis of the inner cylindrical surface,and

(3) means to fixedly space said discs from each other, said means being spaced from the inner surface of the cylinder;

E. said cylinder having a plurality of vertically spaced apart metering piston positioning lugs extending substantially horizontally inwardly from its inner cylindrical surface;

F. said lower guide disc of said metering piston being provided with slots in its outer periphery of size and shape to allow passage of said lower disc past said positioning lugs when the piston and cylinder are positioned to vertically align the lugs with the slots;

G. said lugs being of configuration to prevent longitudinal movement of said piston with respect to said cylinder at least in direction away from said cylinder upper edge surface when said slots are not vertically aligned with the lugs; and

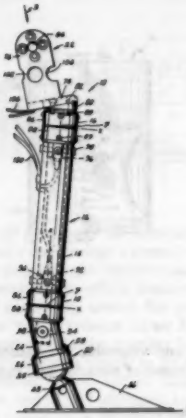
H. each of said lugs being so positioned vertically that when it is associated with the lower piston disc to prevent longitudinal movement of the piston with respect to the cylinder, the space between the upper face of the upper piston disc and the plane of the cylinder upper discoidal edge surface and within the cylindrical wall defines precisely at least one of the volumes which the measuring cup is predesigned to measure by indicia on a surface of said cylinder.

4,488,433

CRASH TEST DUMMY LOWER LEG STRUCTURE

Robert A. Denton, Troy, and Craig R. Morgan, Auburn Heights, both of Mich., assignors to Robert A. Denton, Inc., Rochester, Mich.

Filed Dec. 8, 1982, Ser. No. 447,876
Int. Cl.³ G01N 33/00; G09B 23/32
U.S. Cl. 73—432 R 15 Claims



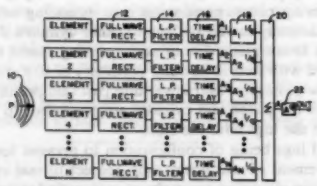
1. In a crash test dummy lower leg structure, an ankle-foot assembly comprising an ankle shell forming a spherical socket, a ball movably fitted in said socket so as to be capable of rotation about three mutually perpendicular axes which intersect at the center of said ball, a stem projecting from said ball through an opening in said shell for connection to a foot member, and means for precisely controlling and positively restricting the movement of said ball to the aforesaid rotation about said three mutually perpendicular axes only.

4,488,434

PHASE INSENSITIVE DETECTOR FOR USE IN ULTRASONIC SCANNER AND METHOD

Matthew O'Donnell, Schenectady, N.Y., assignor to General Electric Company, Milwaukee, Wis.

Filed May 13, 1983, Ser. No. 494,339
Int. Cl.³ G01N 29/04
U.S. Cl. 73—602 5 Claims



1. In an ultrasound scanning system, a method of phase insensitive processing of a backscattered signal comprising the steps of:

(a) detecting said backscattered signals with a phased array of detector elements;

(b) full wave rectifying and low pass filtering each detected signal;

(c) time delaying each filtered signal as a function of expected travel time from a target to each detector element;

(d) nonlinearly processing of each signal from each detector element by power law compression;

(e) summing all nonlinearly processed signals; and

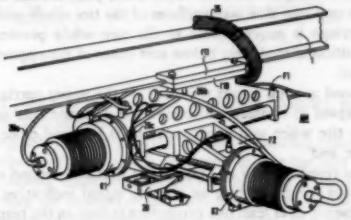
(f) expanding the sum of all nonlinearly processed signals using an inverse of said power law compression.

4,488,435

ANALYSIS MANIPULATOR FOR NON-DESTRUCTIVE MATERIAL TESTING, AND METHOD FOR CONTROLLING THE COORDINATES THEREOF

Hans Kastl, Neustadt; Rainer Bauer, Herzogenaurach, and Erich Modlich, Forchheim, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 431,637
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1981, 3143609
Int. Cl.³ G01V 29/00
U.S. Cl. 73—618 13 Claims



1. Manipulator for positioning a testing head for non-destructive material testing of tanks and pipelines in the primary loop of nuclear power plants, comprising a testing head support device, a coordinate-moving mechanism including a first guide frame with a first coordinate drive and a second guide frame with a second coordinate drive, each of said coordinate drives including straight guides and a drive, said drives having a spindle with two opposite ends, a nut being movable by said spindle along said straight guides and rotating balls disposed between said nut and said spindle, a mounting flange connecting said first guide frame to said testing head support device, said second guide frame being movable by said first coordinate drive, a testing head mount supporting the testing head and being movable by said second coordinate drive, multi-phase stepping motors each being connected to one end of a respective one of said spindles, and incremental rotarty motion transmitters each being connected to the other end of a respective one of said spindles for transmitting the actual rotary position of said spindles to control devices outside the manipulator.

4,488,436

PRESSURE SENSOR

Kaneo Mohri, Fukuoka, and Takeshi Nakane, Okazaki, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation of Ser. No. 416,279, Sep. 9, 1982, abandoned. This application Feb. 27, 1984, Ser. No. 582,162
Claims priority, application Japan, Sep. 9, 1981, 56-141852
Int. Cl.³ G01L 9/04
U.S. Cl. 73—726 8 Claims

1. A pressure sensor for converting a fluid pressure into electric signals, said pressure sensor comprising:

a diaphragm producing a tension in a radial direction thereof under the pressure;

a casing member supporting said diaphragm; and

a resistance body means being made of an amorphous metal and comprising two resistance body groups having at least two resistance body elements respectively, wherein said groups are positioned in radial directions of said diaphragm so as to intersect at right angles each other, and

wherein said elements are positioned in the same direction;

each of said resistance body elements having a portion which occupies a large proportion to the total length and which is positioned in the substantially same direction;

said resistance body elements being able to be connected by a bridge circuit, wherein said elements intersecting at right angles each other may be constructed as adjacent sides of said bridge circuit.

4,488,437

PROCESS FOR TIGHTENING OF A JOINT HAVING A THREADED JOINT ELEMENT

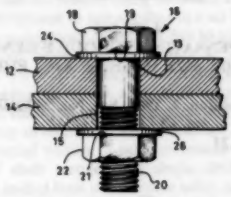
Christian Pere, Maroc, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed May 20, 1983, Ser. No. 496,641

Claims priority, application France, May 26, 1982, 82 09108

Int. Cl.³ F16B *31/02*

U.S. Cl. 73—761 **10 Claims**



1. A process for tightening a joint having a threaded joint element for applying to this joint a predetermined tightening force, said process comprising the steps of:

(a) first, applying a preliminary screwing cycle to said joint element;

(b) second, measuring the screwing torque (Cv) applied to said joint element as a function of the angular displacement of said joint element, during the application of said preliminary screwing cycle;

(c) third, applying a preliminary unscrewing cycle to said element;

(d) fourth, measuring an unscrewing torque (Cd) applied to said joint element as a function of the angular displacement of said joint element during the application of said preliminary unscrewing cycle;

(e) fifth, calculating a real factor of proportionality (K) between the tightening force of said joint and the screwing torque applied to said joint element, as a function of results obtained during said second and fourth steps;

(f) sixth, calculating a final screwing torque (Cf) to be applied to said joint element to obtain said predetermined tightening force (F), as a function of said real factor of proportionality (K); and

(g) seventh, applying said final screwing torque (Cf) to said joint element.

4,488,438

SQUARE-WAVE CURRENT GENERATOR

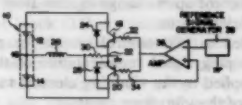
Toyofumi Tomita, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 4, 1983, Ser. No. 481,945

Claims priority, application Japan, Apr. 19, 1982, 57-65095

Int. Cl.³ G01F *1/60*

U.S. Cl. 73—861.12 **8 Claims**



1. A square-wave current generator which supplies an excitation coil for producing a magnetic field with an exciting current periodically reversing its flowing direction comprising:

a power supply section for supplying the exciting current, said power supply section including a first center terminal;

control element means connected in series across said power supply section, said control element means including a second center terminal in the center of the series connection;

a current detecting element connected in series with said excitation coil between said two center terminals to deliver a voltage output signal corresponding to the exciting current;

a reference signal generator alternately delivering positive and negative square-wave voltage signals of the same amplitude with a given period; and

an amplifying section supplied with the output signal from said current detecting element and the square-wave voltage signals from said reference signal generator to alternately apply on and off signals to said control element means on both sides of said second center terminal, thereby causing an exciting current corresponding to the square-wave voltage signal in period, amplitude and polarity to flow through said excitation coil.

4,488,439

MASS FLOW METER WITH VIBRATION SENSOR

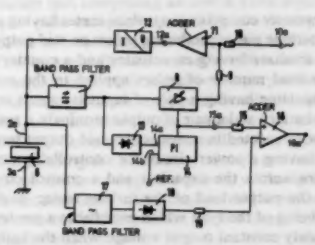
Theodor Gast, Berlin; Kurt Binder, Stuttgart, and Günter Hönig, Ditzingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 6, 1982, Ser. No. 405,725

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1981, 3131561; Sep. 4, 1981, 3134985

Int. Cl.³ G01F *1/78*

U.S. Cl. 73—861.18 **9 Claims**



1. Mass flow meter, particularly to determine gas or air flow having a vibratory system including

a mechanical vibratory element and

an oscillator circuit coupled to said element and inducing vibrations therein,

and comprising

a controlled variable amplification amplifier connected in the oscillator circuit;

a control circuit controlling the amplification of the amplifier, and hence the oscillatory energy supplied to the vibratory element to maintain constant amplitude vibrations of the vibratory element under conditions of variable damping thereof upon change in mass flow impinging on the vibratory element,

means coupled to said control circuit for generating an output damping signal representative of the oscillatory energy supplied to the vibrating element to maintain the amplitude of the vibrations constant;

the amplification of the amplifier, as controlled by said control circuit being representative of the rate of said fluid mass flow; and

means for generating a signal representative of damping of the vibratory element independently of fluid flow, including

a source of alternating current having a frequency different from the frequency of oscillation of the oscillator circuit, and connected to the oscillator circuit to apply said alternating current to the mechanical vibratory element;

means for separating said flow independent damping signal from a signal generated by said oscillator circuit;

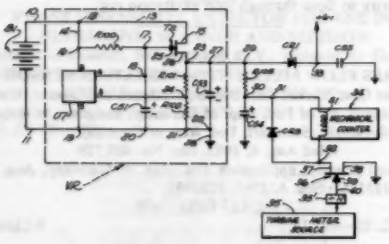
and means for subtracting the flow independent damping signal from said output damping signal to provide a flow meter output signal representative of mass flow of gas or air.

4,488,440

MICROPOWER CIRCUIT

Christopher A. Watson, Upland, Calif., assignor to International Telephone & Telegraph Corporation, New York, N.Y.

Filed Mar. 7, 1983, Ser. No. 472,531
Int. Cl.³ G01F *15/06*
U.S. Cl. 73—861.77 **5 Claims**



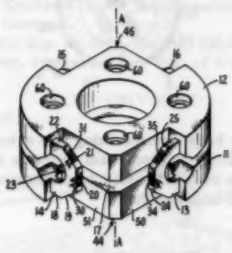
1. A flowmeter comprising: a turbine meter having an output lead, said turbine meter producing pulses on said output lead; a battery; a totalizer having an actuator and a counter for indicating the total number of pulses applied to the actuator; a voltage regulator having a pair of input terminals connected across the battery and a pair of output terminals, a resistor and a capacitor connected in series across said output terminals; a transistor having a power circuit for controllably connecting the actuator across the capacitor and a control circuit connected to the output lead of the turbine meter; said voltage regulator being of the type which establishes a predetermined approximately constant output voltage when the battery voltage is substantially greater than said predetermined voltage, and which establishes an output voltage that tracks the battery voltage when the battery voltage falls below said predetermined voltage.

4,488,441

APPARATUS FOR SIMULTANEOUS MEASUREMENT OF MUTUALLY PERPENDICULAR FORCES AND MOMENTS

John E. Ramming, Davis, Calif., assignor to JR3, Inc., Woodland, Calif.

Filed Apr. 15, 1983, Ser. No. 485,589
Int. Cl.³ G01L *5/16*
U.S. Cl. 73—862.04 **7 Claims**



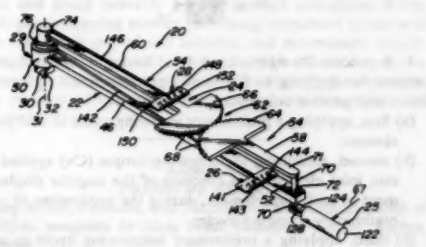
1. An apparatus for measuring forces or moments, or both, in at least three mutually perpendicular directions comprising two rigid plate members that are generally parallel and spaced apart by at least three curved arch segments forming a drive connection therebetween, strain measuring means mounted on each of said arch segments to detect mechanical deformation of each of said segments due to forces and moments imposed between said plates and means for converting said deformations into electrical signals representative of said forces and moments between said plates.

4,488,442

COMPENSATING TORQUE WRENCH

Louis A. Pacinelli, 6522 Haverford Ave., Philadelphia, Pa. 19151

Filed Jun. 1, 1983, Ser. No. 500,060
Int. Cl.³ B25B *23/142*
U.S. Cl. 73—862.21 **24 Claims**



1. A compensating torque wrench device for rotating an internally threaded member on an externally threaded member in a manner designed to reduce the amount of stress on said externally threaded member adjacent its interface with said internally threaded member, said externally threaded member having a free end including third engagement means, said device comprising a working end including first engagement means for engaging said internally threaded member and second engagement means in the form of a rotatable projection for engaging said third engagement means of said externally threaded member, first and second rotational means and a driven end, wherein said driven end is connected to said first engagement means by said first rotational means and to said second engagement means by said second rotational means in a

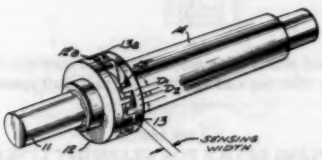
manner such that force applied to said driven end causes the first rotational means to exert a first predetermined amount of torque on said first engagement means and thus on said internally threaded member, causing them to rotate in a first rotational direction and causes the second rotational means to exert a second predetermined amount of torque on said second engagement means and thus on said externally threaded member, causing them to rotate in the opposite rotational direction.

4,488,443

EXPANDED RANGE MONOPOLE TORQUE MEASURING SYSTEM

James R. Parkinson, Vergennes, Vt., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed Jan. 20, 1983, Ser. No. 459,492
Int. Cl.³ G01L 3/10
U.S. Cl. 73—862.33 **14 Claims**



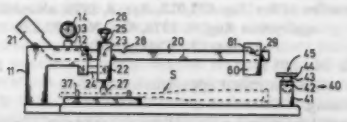
13. A torque measuring system for measuring torque on a shaft comprising first and second toothed wheels mounted in spaced apart relationship on the shaft, each of said first and second wheels having a plurality of axially extending spaced teeth along its periphery extending into spaces between the teeth of the other wheel and forming therewith an interlaced array of teeth having tooth spacing interstices therebetween, said first and second wheels being mounted so that their teeth are offset with respect to one another in a no load condition so as to permit greater tooth deflection due to torque, at least one of said first and second wheels having at least one sensible index marker on its periphery comprising a discontinuity in said tooth spacing interstices, a single detector means rotatable relative to the shaft and mounted proximate the shaft near said interlaced array of teeth, said single detector means responsive to circumferential widths of said interstices for providing an indication of shaft torque, said single detector means also responsive to said at least one sensible index marker for providing an indication for system indexing at least once per shaft revolution.

4,488,444

TESTING DEVICE FOR TENNIS RACQUETS

Ulrich Weidmann, Industriestrasse 13, CH-8152 Glattbrugg, and Hans R. Weber, Althoosteig 11, CH-8046 Zurich, both of Switzerland

PCT No. PCT/CH82/00034, § 371 Date Nov. 22, 1982, § 102(e) Date Nov. 22, 1982, PCT Pub. No. WO82/03274, PCT Pub. Date Sep. 30, 1982
PCT Filed Mar. 4, 1982, Ser. No. 449,010
Claims priority, application Switzerland, Mar. 23, 1981, 1963/81
Int. Cl.³ G01L 5/06; G01N 3/20
U.S. Cl. 73—862.45 **8 Claims**



1. A testing device for tennis racquets to measure the tension of the stringing, comprising a base plate (**10**) with two detachable lateral supporting bars (**30**) adjustable to accommodate and center the frame of a tennis racquet to be tested, a bracket block (**11**) connected to the base plate and supporting a weight loaded beam (**20**) pivotably mounted therein, said beam being provided with a plunger (**27**) directed onto the center of a strung frame to be tested, and a gauge (**14**) attached to said bracket block with the plunger of said gauge resting on said beam (**20**).

8. Process for measuring the stiffness of a strung or unstrung tennis racquet frame using an apparatus comprising a base plate (**10**), a bracket block (**11**) connected to said base plate and supporting a weight loaded beam (**20**) pivotably mounted therein, said beam being provided with a plunger (**27**) directed onto the frame to be tested, and a gauge (**14**) attached to said bracket block with the plunger of the gauge resting on said beam (**20**), a bracing bar (**50**) is detachably provided in the mid area of said base plate (**10**) and transversely to its longitudinal axis, and a counterbracket (**40**) for the grip of said racquet to be tested provided at the end of said base plate opposite said bracket block, said process comprising the following steps:

(a) Placing the grip of said racquet to be tested underneath said counterbracket (**40**) up to a line marking (**16**) so that the top edge of said frame is positioned under said plunger (**27**);

(b) Lowering said beam (**20**) until said plunger (**27**) engages said top edge of said frame, whereby the weight of said beam produces a pretension;

(c) Setting said gauge (**14**) to zero;

(d) Suspending a weight (**60**) from said beam (**20**);

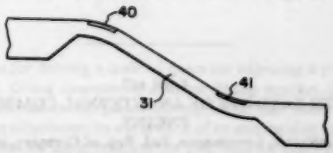
(e) Recording the lowering distance of said plunger (**27**) on said gauges.

4,488,445

INTEGRATED SILICON ACCELEROMETER WITH CROSS-AXIS COMPENSATION

Vernon H. Aske, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 28, 1983, Ser. No. 546,258
Int. Cl.³ G01P 15/12
U.S. Cl. 73—517 R **5 Claims**



1. In an accelerometer, in combination:

a pendulum unit comprising an inertia plate separate from a support plate except at a pair of flexure sites spaced along a flexure axis, each flexure site including an inward flexure and an outward flexure mutually offset so that an input acceleration of the unit in a direction perpendicular to said inertia plate produces compound bending in said flexures;

a pair of strain responsive resistors carried by one surface of one of said flexures and positioned so that upon said compound bending the resistances of each pair are subject to physical strains of opposite senses, while upon accelerations in directions orthogonal to said input acceleration both resistors of said pair are subject to physical strains in the same sense; and

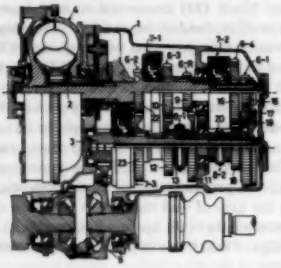
means electrically interconnecting said resistors to give an output which varies with differential changes in the resistances of said resistors.

4,488,446

TRANSMISSION APPARATUS FOR A VEHICLE

Masao Nishikawa, Tokyo; Torao Hattori; Takashi Aoki, both of Wako, and Hiroshi Yoshizawa, Kamifukuoka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 19, 1982, Ser. No. 379,923
Claims priority, application Japan, May 20, 1981, 56-74798
Int. Cl.³ F16H 3/08
U.S. Cl. 74—330 5 Claims



1. A transmission apparatus for a vehicle comprising a casing, an input shaft in the casing connected to an engine of the vehicle, an output shaft in the casing disposed parallel to the input shaft and connected to a driving wheel of the vehicle, at least four gear trains of different change speed stages interposed between the two shafts through respective clutches, at least one of the respective clutches being arranged to be an in-common clutch used in common to two of the at least four gear trains, so that the two gear trains may be selectively interposed between the two shafts through the common clutch and at least one selection mechanism provided separately from the in-common clutch, wherein the two gear trains are those differentiated in change speed stage one from another by three stages, and the two gear trains are so arranged that, in case of power transmission through any selected gear train other than the two gear trains, such one of the two gear trains that has a change speed stage which is nearer the change speed stage of the selected gear train has been selected by the selection mechanism.

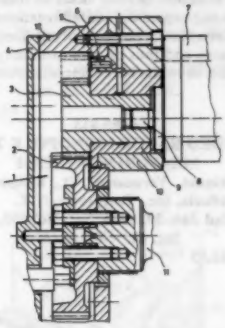
4,488,447

POWER TAKE-OFF OF AN INTERNAL COMBUSTION ENGINE

Hans Gebhardt, Langenzenn, Fed. Rep. of Germany, assignor to M.A.N. Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

Filed Jul. 2, 1982, Ser. No. 394,703
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1981, 3126243
Int. Cl.³ F16H 35/06, 3/08
U.S. Cl. 74—397 6 Claims

1. A power take-off of an internal combustion engine such as Otto- and Diesel motors for driving an auxiliary machine such as a compressor, pump and the like, with said internal combustion engine being provided with an output shaft, and said auxiliary machine being provided with an input shaft, said power take-off comprising gear means for drivingly connecting said input shaft of said auxiliary machine with said output shaft of said internal combustion engine; with the spacing between said input shaft and said output shaft being variable in order to change the step-up/step-down ratio, a flanged housing, and an eccentric bearing bushing arranged in said flanged housing in such a way as to be axially displaceable and rotatable; said gear means including a drive gear subject to retention and a pinion mounted on said input shaft of said auxiliary



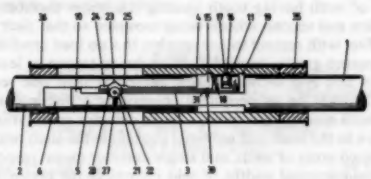
machine, said pinion being supported in said eccentric bearing bushing for effecting said variability of said shaft spacing.

4,488,448

DECOUPLING DEVICE FOR GEARSHIFT LINKAGES

Karl-Rudi Leuer, Russelsheim, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 7, 1983, Ser. No. 472,746
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1982, 3213662
Int. Cl.³ G05G 9/18
U.S. Cl. 74—473 R 12 Claims



1. Decoupling device for linkages, especially linkages of the type disposed between the transmission and the gearshift lever of motor vehicles, said decoupling device being disposed between two gearshift rods and adapted to permit, after the transmission has been shifted into one of the gears, forward and backward movement of the decoupled gearshift rod, the improvement comprising: a tubular member housing said two gearshift rods; and an axially displaceable intermediate member, for controlling the decoupling operation, being operatively disposed between the gearshift rods which are in engagement with one another and also being mounted in said tubular member.

4,488,449

CABLE MOUNTING AND ADJUSTMENT MEANS

Michael E. Moore, Aurora, and Stamos I. Papasideris, Bristol, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 675,025, Apr. 8, 1976, abandoned. This application Aug. 9, 1978, Ser. No. 932,236
Int. Cl.³ F16C 1/10
U.S. Cl. 74—501 R 2 Claims

1. A cable-controlled apparatus comprising

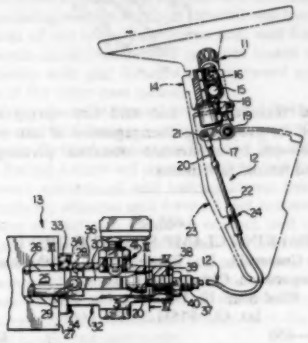
a housing,

a control member reciprocally mounted in said housing and having a slot formed therein,

flexible push-pull cable means connected to said control

member for selectively reciprocating the same, said cable means being connected to said control member by a pin attached to said cable means and removably disposed in said slot and said pin being secured between bifurcated arms of a clevis, said clevis being threadably mounted on said cable means for adjusting the axial position of said pin relative to said slot,

a bracket having a flange formed integrally therewith and detachably mounted on said housing by at least one releas-



able fastening means extending through said flange for securing said flange directly to said housing and mounting said cable means thereon, and

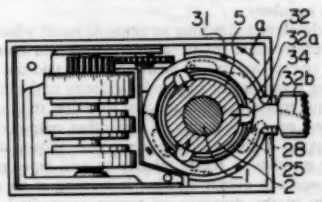
adjustment means adjustably mounting said bracket on said cable means directly for movement towards and away from said housing, upon complete removal of said fastening meansfrom said housing, comprising interengaging screw threads threadably mounting said bracket on said cable means for adjusted axial movements relative thereto and to the housing.

4,488,450

DEVICE FOR RELEASABLY SECURING A FINELY ANGULARLY ADJUSTED SHAFT

Akira Sakai, Kamifukuoka, Japan, assignor to Tokyo Kinzoku Kabushikikaisha, Japan

Filed Feb. 18, 1983, Ser. No. 467,854
Int. Cl.³ G05G 7/06
U.S. Cl. 74—531 **6 Claims**



1. In a device for releasably securing stationarily a finely angularly adjusted shaft in an instrument with respect to the body thereof including a cylindrical flange formed in said body and rotatably supporting said shaft therein, said flange having a plurality of cut-out portions arranged circumferentially spaced apart from each other, a rotatable clamping ring rotatably fitted around said flange and having in its inner periphery the same number of wedge-shaped recesses as that of said cut-out portions, the relative circumferential positions of said recesses to each other corresponding to the relative circumferential positions of said cut-out portions to each other, and a clamping member each received in each said cut-out portion and each said wedge-shaped recess around said shaft thereby permitting said shaft to be secured stationarily with respect to said body by rotating said clamping ring in one direction in which said clamping members are pressed against said shaft so as to fixedly secure the same by virtue of said wedge-shaped recesses slidingly engaging with said clamping members during the rotation of said clamping ring, while said shaft is permitted to freely rotate by rotating said clamping ring in the opposite direction, the improvement wherein a pivot pin is formed in said body adjacent to each said cut-out portion of said cylindrical flange and each of said clamping members is formed with an ear portion having an opening formed therein, each said pivot pin being rotatably received in said opening of each said clamping member thereby preventing each said clamping member from being rollingly rotated in said cut-out portion to insure the accuracy of stationarily securing said shaft at said finely angularly adjusted position.

4,488,451

INTEGRAL HAND KNOB GEAR

Karl-Heinz G. Ligensa, and Philip Cherdron, both of Battle Creek, Mich., assignors to Keiper U.S.A. Inc., Battle Creek, Mich.

Filed Feb. 18, 1982, Ser. No. 359,573
Int. Cl.³ G05G 1/10
U.S. Cl. 74—553 **9 Claims**

1. Means for driving a train of gears for adjusting a pivoted seat hinge fitting comprising a hinge fitting bracket formed with spaced sandwich plates having inner and outer faces adapted for attachment to a seat back of an automotive vehicle, a hinge pivot an input position for said train of gears remote from the hinge pivot, integral spur gear and hand knob support disc means, and rivet pivot means secured on the outer face of a plate of said hinge fitting bracket for mounting said integral means at said input position, and means on said support disc means for supporting with drive engagement a hand knob applied thereto.

4,488,452

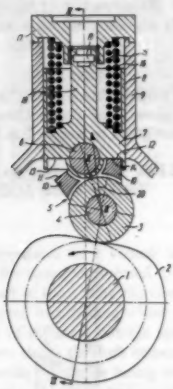
DRIVE MECHANISM FOR A FUEL PUMP OF A REVERSIBLE TWO-STROKE ENGINE

Finn Q. Jensen, Copenhagen, Denmark, assignor to B&W Diesel A/S, Denmark

Filed Apr. 16, 1982, Ser. No. 369,143
Claims priority, application Denmark, May 6, 1981, 2016/81
Int. Cl.³ F16H 53/06; F01L 13/02; F04B 39/10
U.S. Cl. 74—569 **2 Claims**

1. A drive mechanism for a fuel pump of a reversible two-stroke internal combustion engine, comprising:

a housing,
a roller guide guided in said housing for reciprocating movement perpendicular to a rotary control shaft of the engine and having coupling means for the plunger of a fuel pump,
an arm connected at one end to said roller guide by means of a pivot joint, the axis of which is parallel to the axis of rotation of said control shaft,
a follower roller rotatably supported at the opposite end of said arm by means of a journal pin,
spring means biasing said roller guide towards said control shaft for maintaining contact between said follower roller and an actuating cam secured to said control shaft,
and means for pivoting the arm relative to the roller guide between two end positions so as to shift the axis of the



journal pin from one side of a plane extending through the axes of the pivot joint and the control shaft to the opposite side of that plane and vice versa,
means for defining each end position of the arm comprising pairs of cooperating abutment surfaces between the roller guide and the arm, respectively, said pairs of surfaces located on opposite sides of said plane and each pair of abutment surfaces being located on one side of said plane and spaced from said plane such that in any angular position of the control shaft the line of action of a force exerted by the follower roller on its journal pin when the follower roller is actuated by the actuating cam passes between the axis of the pivot joint and an operative pair of abutment surfaces.

4,488,453

BICYCLE PEDAL FOR COUPLING A SHOE IN PRESET POSITION, AND A CYCLIST'S SHOE FITTED TO SAID PEDAL

Jean-Francois Drugeon, 1 bis rue Maleville, and Jean Badersbach, Castellou - Planiolles, both of 46100 Figeac, France

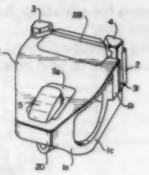
Filed Feb. 12, 1982, Ser. No. 348,164

Claims priority, application France, Feb. 13, 1981, 81 03039; Jul. 8, 1981, 81 13811

Int. Cl.³ G05G *1/14*

U.S. Cl. 74—594.6 **16 Claims**

1. A bicycle or the like pedal for securing thereto the shoe of a cyclist, comprising:
(a) a body;
(b) first and second jaw means pivotally connected to said body and adapted for cooperatively engaging said shoe for securing said shoe therebetween;
(c) first and second cooperating spring means associated with said body, said spring means cooperatively acting on said jaw means for pivoting said jaw means into engagement with said shoe; and,
(d) said first spring means being stiffer than said second spring means whereby said second spring means is adapted for cooperatively pivoting said first and second jaw means through a small arc for maintaining said shoe



secured therebetween and said first spring means is adapted for preventing disengagement of said shoe from therebetween by unintended substantial pivoting of said first and second jaw means.

4,488,454

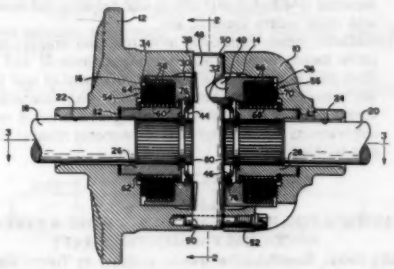
BALKING CLAMP POSITIVE DRIVE

Edward J. Goscenski, Jr., Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 10, 1982, Ser. No. 356,873

Int. Cl.³ F16H *35/04, 1/44*

U.S. Cl. 74—650 **13 Claims**



1. A positive drive comprising:
(a) an input member adapted to be rotated by driving torque transmitted from a power source to rotate a pair of spaced output members;
(b) first clutch means having an engaged mode which locks in a predetermined rotational relationship said input member to one of said output members when said one output member is rotating at an angular velocity in the direction of torque transmittal that is equal to or less than a predetermined angular velocity of said other output member and having a disengaged mode which allows said one output member to rotate relative to said input member when said one output member is rotating at an angular velocity in the direction of torque transmittal that is greater than a predetermined angular velocity of said other output member;
(c) second clutch means spaced from said first clutch means and having an engaged mode which locks in a predetermined rotational relationship said input member to said other output member when said other output member is rotating at an angular velocity in the direction of torque transmittal that is equal to or less than a predetermined angular velocity of said one output member and having a disengaged mode which allows said other output member to rotate relative to said input member when said other output member is rotating at an angular velocity in the direction of torque transmittal that is greater than a predetermined angular velocity of said one output member;

(d) first cam means having forward and rearward cam surfaces and forward and rearward contact surfaces, said first cam means being movable to move said first clutch means from said disengaged mode to said engaged mode;

(e) second cam means having forward and rearward cam surfaces and forward and rearward contact surfaces, said second cam means being movable to move said second clutch means from said disengaged mode to said engaged mode, said first and second cam means being disposed adjacent one another with said forward and rearward cam means facing respectively said forward and rearward cam surfaces of the other cam means and, said forward and rearward contact surfaces of one cam means aligned respectively with said forward and rearward contact surfaces of the other cam means;

(f) a balking clamp interposed between said first and second cam means and having a pair of arms, one of said arms having a forward contact surface and the other of said arms having a rearward contact surface, said forward and rearward surfaces of said balking clamp being located respectively adjacent said forward and rearward contact surfaces of said cam means to contact said cam means contact surfaces upon movement of one of said cams means relative to the other of said cam means to limit the movement of said cams means relative to one another; and

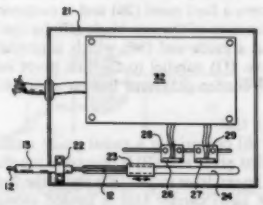
(g) means to exert a force on at least one of said cams means to move said cam means and thereby move the respective clutch to said engaged mode.

4,488,455

ELECTRONIC SHIFTING AND IGNITION CONTROL SYSTEM FOR MOTORCYCLES

Robert L. Shetler, R.D. #1, Box 78, Shelby, Ohio 44875; Robert Merritt, Laguna Hills, and Torsak Sethanant, Garden Grove, both of Calif., assignors to Robert L. Shetler, Shelby, Ohio

Filed Sep. 2, 1981, Ser. No. 298,509
Int. Cl.³ B60K *41/08*
U.S. Cl. 74—851 **10 Claims**



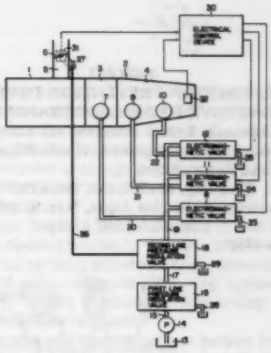
9. A motorcycle ignition system disabling system for use with motorcycles having an internal combustion engine, an ignition system, a multispeed transmission having a mechanical shift actuator and a neutral position, a neutral indicator light, a clutch and a side stand; said ignition disabling system comprising an ignition system disabling switch having a disabling switch control terminal, said disabling switch interrupting ignition system current when said disabling switch control terminal is unground; a clutch switch, said clutch switch grounding said control terminal when said clutch is activated; inverter switch means having an inverter switch control terminal, said inverter switch grounding said disabling switch control terminal when high voltage is applied to said inverter switch control terminal; a side stand switch having a low output when said side stand is in the down position; a neutral indicator light signal having a low value when said transmission is in said neutral position and a high value at all other times; a side stand switch-neutral indicator light signal circuit grounding said inverter switch control terminal when said side stand is in the down position and neutral indicator light signal has a high value; and, a shift sensing means applying high voltage to said inverter switch control terminal during period when said transmission is being shifted.

4,488,456

ELECTRICAL/HYDRAULIC TRANSMISSION CONTROL SYSTEM VARYING LINE PRESSURE ACCORDING TO ENGINE LOAD

Yutaka Taga, and Shinya Nakamura, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 26, 1982, Ser. No. 401,605
Claims priority, application Japan, Aug. 19, 1981, 56-130474
Int. Cl.³ B60K *41/08*; F16H *3/74*
U.S. Cl. 74—866 **7 Claims**



1. For an automatic transmission, for a vehicle comprising an engine, comprising a gear transmission mechanism which comprises a power input shaft powered by said engine, a power output shaft which powers said vehicle so as to drive said vehicle along the road, and at least one hydraulic fluid pressure actuated friction engaging mechanism; and which according to selective supply of hydraulic fluid pressure to said hydraulic fluid pressure actuated friction engaging mechanism provides particular ones of a plurality of speed stages between said power input shaft and said power output shaft:

a transmission control system, comprising:

(a) a first engine load sensor which senses the current value of a first parameter representative of the load on said engine and outputs a mechanical movement representative of said current value of said first parameter;

(b) a second engine load sensor which senses the current value of a second parameter representative of the load on said engine and outputs an electrical signal representative of said current value of said second parameter;

(c) a vehicle road speed sensor which senses the current value of a parameter representative of the current road speed of said vehicle and which outputs a vehicle road signal representative of said current value of said parameter representing vehicle road speed;

(d) a line hydraulic fluid pressure generator which is mechanically controlled by said mechanical movement output from said first engine load sensor and generates a line hydraulic fluid pressure varying in response to the current value of said mechanical movement output;

(e) an electrically actuated hydraulic fluid pressure switching valve, which according to selective supply of actuating electrical energy thereto selectively supplies said line hydraulic fluid pressure to said hydraulic fluid pressure actuated friction engaging mechanism as an actuating hydraulic fluid pressure; and

(f) an electrical control device, which receives the current value of said electrical signal from said second engine load sensor and the current value of said vehicle road speed signal from said vehicle road speed sensor, and which

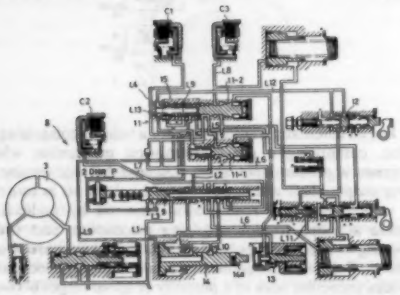
according to the current values of said engine load electrical signal and said vehicle road speed signal selectively supplied actuating energy to said electrically actuated hydraulic fluid pressure switching valve.

4,488,457

MALFUNCTION PREVENTION DEVICE OF AUTOMOTIVE HYDRAULIC TRANSMISSION

Sadanori Nishimura; Keiichi Ishikawa, and Hiroyuki Shimada, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 8, 1982, Ser. No. 439,773
Claims priority, application Japan, Nov. 9, 1981, 56-178311
Int. Cl.³ B60K *41/16*
U.S. Cl. 74—868 **1 Claim**



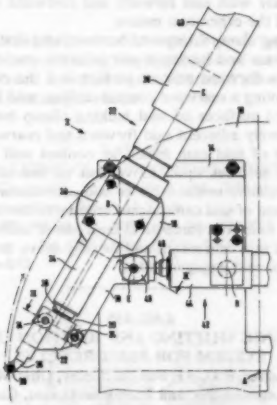
1. In a hydraulic transmission for use in a vehicle driven by an internal combustion engine, the transmission having an oil hydraulic circuit provided with a manually-operated valve, a hydraulic pressure source, a circuit for establishing engagement of forward transmission elements, disposed for connection with said hydraulic pressure source through the shifting action of said manually-operated valve to a forward position thereof, the improvement comprising, in combination: a shift valve assembly controlling operation of said engagement-establishing circuit, means for supplying said shift valve assembly with two control signals counteracting each other, one indicative of the throttle opening of the engine and the other indicative of the vehicle speed, a circuit for establishing engagement of a reverse transmission element, disposed for connection with said hydraulic pressure source through the shifting action of said manually-operated valve to its reverse position, means disposed for engagement with said second-mentioned engagement-establishing circuit and operable in response to said control signal indicative of the vehicle speed for causing disengagement of the same circuit from the reverse transmission element at a vehicle speed higher than a predetermined vehicle speed, and means whereby said shift valve assembly is controlled solely by said vehicle speed signal while simultaneously said throttle opening signal to said shift valve assembly is interrupted when said manually-operated valve is in a reverse running position, whereby said shift valve assembly operates also as a malfunction-preventive valve.

4,488,458

APPARATUS FOR ADVANCING A SAW BLADE IN A MACHINE FOR WORKING ON SAWS

Ernst Beck, Maselheim, and Peter Lenard, Biberach an der Riss, both of Fed. Rep. of Germany, assignors to Vollmer Werke Maschinenfabrik GmbH, Biberach an der Riss, Fed. Rep. of Germany

Filed Aug. 5, 1983, Ser. No. 520,728
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1982, 3230277
Int. Cl.³ B23D *63/14*
U.S. Cl. 76—77 **2 Claims**



1. An apparatus for advancing a saw blade in a machine for working on saws, comprising a linear drive means (32) adapted to be controlled and pivotable about a first pivot axis (B) in parallel with the axis (A) of the saw blade (10), a pawl carrier (22) which carries a feed pawl (26) and is reciprocable in circumferential direction of the saw blade (10) by the linear drive means (32), and a guide rod (46) which is pivotable about a second pivot axis (D) parallel to the first pivot axis (B), supports the pawl carrier (22), and has an adjustable effective length,
characterized in that
a guide body (18) comprising a radial guide means (20) with respect to the first pivot axis (B) is pivotable together with the corresponding linear drive means (32) about the first pivot axis (B), in that the pawl carrier (22) is guided along the radial guide means (20), in that the feed pawl (26) is fixed rigidly to the pawl carrier (22), and in that the guide rod (46) is a member of a second controllable linear drive means (42) and is pivoted to the guide body (18).

4,488,459

RATCHET WRENCH

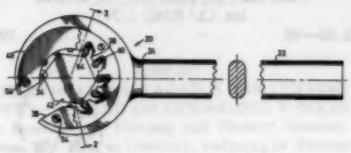
Roy E. Bailey, 44 Water St., Clifton, Tenn. 38425, and Ben J. Bailey, 901 Michigan, Brighton, Mich. 48116

Filed Sep. 27, 1982, Ser. No. 424,093
Int. Cl.³ B25B *13/46*
U.S. Cl. 81—58.2 **12 Claims**

9. A ratchet wrench head comprising a substantially cylindrical body having a central opening therethrough, a plurality of recesses extending radially outward from the inner periphery of the central opening and adapted to retain a plurality of pawls in the recesses, said recesses each formed with a thrust wall extending radially and a reaction wall extending at an acute angle to the thrust wall, a set of nut engageable pawls acting as jaw members retained in the recesses, the pawls having integral flexible portions and each pawl extending substantially the same distance into the central opening, said

extended portion of each pawl including a substantially semi-cylindrical nut engageable portion and said set of pawls being replaceable by other sets of pawls that extend differing distances into the central opening,

wherein engagement by a nut on the opposite side of said



extended portion of the pawl from the thrust wall causes tight driving engagement of the nut, and

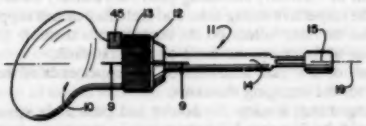
wherein engagement by a nut on the same side of the extended portion of the pawl as the thrust wall causes flexible swinging of the pawl to permit the nut to ratchet by the pawl.

4,488,460

ERGONOMIC HANDLE FOR HAND TOOL

Michael P. Ballone, New Providence, and Edward H. Meisner, Short Hills, both of N.J., assignors to EASCO Corporation, Baltimore, Md.

Filed Jul. 28, 1982, Ser. No. 402,763
Int. Cl.³ B25B *13/46*; B25G *1/00*
U.S. Cl. 81—60 3 Claims



1. In a hand ratchet tool or other implement, the combination of a shank means having a longitudinal axis, an ergonomic handle having a substantially elliptical cross-section provided with a center and a major axis, the longitudinal axis of the shank means substantially passing through the center of the elliptical cross-section and intersecting its major axis, the handle being formed substantially as a surface of revolution of the elliptical cross-section about its major axis, the handle having a forwardly-extending relatively-short integral neck portion provided with a bore and a communicating counterbore therein, and a ratchet mechanism connecting the handle to the shank means, the ratchet mechanism having a ratchet housing including a rearward portion secured within the bore and further including an annular shoulder seated in the counterbore; wherein the ratchet mechanism includes a selector which extends radially through an arcuate slot in the neck portion, is pivotable about the axis of the shank, and is disposed forwardly of, and substantially adjacent to, the handle; and wherein a spinner is carried by the ratchet mechanism forwardly of, and substantially adjacent to, the selector; whereby the selector and spinner are readily accessible to the operator's thumb and forefinger, respectively, for substantial one-hand control of the ratchet tool.

4,488,461

ADJUSTABLE WRENCH

Carl R. Hurtig, Cohasset, Mass., assignor to Encor, Limited, Cohasset, Mass.

Filed Nov. 20, 1981, Ser. No. 323,658
Int. Cl.³ B25B *13/28*
U.S. Cl. 81—98 10 Claims

1. A wrench for turning all nuts having a number of planar faces and a predetermined maximum size comprising:

an elongate handle having an outwardly curved contact surface disposed on at least one end thereof, said curved surface operative to engage a confronting face of said nut adjacent one corner thereof and generally normal said confronting face;

a wrench head disposed on said one end of said handle and having an opening therein for insertion of said nut, the size of said opening being adjustable to accommodate a range of sizes of nuts, said opening having opposed interior surfaces in spaced confronting relationship with said curved contact surface; and

means for urging said curved contact surface into engagement with said confronting face of a nut disposed within said opening to capture the nut between said curved contact surface and said opposed surfaces to permit the transfer of torque applied to said handle from said contact surface and said opposed surfaces to the faces of said nut at three points, each of said three points being spaced from the center of its associated nut face, said engaged corner being that which is to the side of the nut which is in the same direction as the direction of rotation of said handle.

4,488,462

SCREWDRIVER WITH DUAL TIP

Stanford J. Wall, 751 E. Dalton Ave., Glendora, Calif. 91740

Filed Nov. 9, 1981, Ser. No. 319,194
Int. Cl.³ B25B *15/00*
U.S. Cl. 81—439 13 Claims

1. A screwdriver for use both on a first type screw fastener having a configuration comprising a head with a single slot

therein, and on a second type screw fastener having a configuration comprising a head having two slots therein crossing at about their centers, the screwdriver comprising:

a handle; and

a shaft assembly comprising:

(a) an elongated shaft having one end mounted securely to the handle;

(b) the other end of the shaft comprising a tip segment for engagement of the slots in the head of such a second type fastener;

(c) an elongated slot in the shaft tip segment extending from the distal end of the tip segment along at least a portion of its length;

(d) an elongated hollow sleeve open at both ends slidably mounted on the shaft; and

(e) a blade fixedly connected across the center of the distal opening of the elongated hollow sleeve, the blade mounted in the slot in the shaft tip segment for slidable movement in said slot when the sleeve is moved along the shaft and having a leading edge portion extending beyond the distal sleeve opening for engagement of the single slot in the head of such a first type fastener, the leading edge portion of the blade being in a first position extended beyond the distal end of the shaft tip segment for engagement of the slot of such a first type fastener when the sleeve is in a forward position relatively farther from the handle and the leading edge portion of the blade being in a second position housed within the elongated slot in the shaft tip segment when the sleeve is in a rearward position relatively nearer the handle so that said shaft tip segment can engage the slots of such a second type fastener.

4,488,463

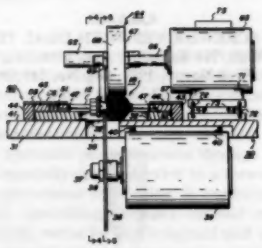
METHOD AND APPARATUS FOR ARMATURE STRIPPING

Armand Postarella, Rochester, N.Y., assignor to Turner Bellows, Inc., Rochester, N.Y.

Filed Mar. 14, 1983, Ser. No. 475,333

Int. Cl.³ B26D *3/16*

U.S. Cl. 83—13 **4 Claims**



1. A method of stripping wire from an armature having a core and a commutator fixed to an armature shaft, said wire being wound on said core and connected to said commutator, the step comprising:

(a) mounting said armature rotatably on a moveable carrier,

(b) moving said carrier and said rotatable armature thereon across a circular saw rotating in a given rotational direction,

(c) cutting said wound wire on said armature by said rotating circular saw in a plane disposed between said core and said commutator and normal to said shaft of said armature, and

(d) rotating said armature with a rotating frictional drive wheel in a rotational direction counter to said given rotational direction of said rotating saw and simultaneously with said cutting of said wire in said plane.

4,488,464

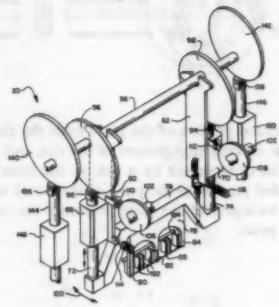
DEVICE FOR CUTTING CONTINUOUS LOGS OF DOUGH

Robert J. Rooke, Duncanville; James E. Skierski, Carrollton, and Raymond V. Brockie, Dallas, all of Tex., assignors to Frito-Lay, Inc., Dallas, Tex.

Filed Mar. 28, 1983, Ser. No. 479,465

Int. Cl.³ B26D *1/547*

U.S. Cl. 83—99 **10 Claims**



1. An apparatus for cutting a log of relatively soft pliable material being continuously advanced forward longitudinally by a conveyor having a surface supporting the log, the apparatus comprising

a wire cutting element,

a movable holder tautly mounting the wire cutting element over and parallel to the conveyor surface and transverse to the advancing log,

frame means extending over an exit end of the conveyor,

a first horizontal shaft rotatably mounted in the frame and extending over the conveyor,

a pair of swing arms pivotably mounted on the first shaft and extending downward therefrom,

a pair of vertically extending push rods slidably mounted on the respective swing arms and including means supporting the movable holder on the bottom ends thereof,

a pair of first cams mounted on the first shaft,

a pair of first cam followers on the upper ends of the push rods for engaging the cams,

spring means biasing the holder and push rods upward to hold the first cam follower means in engagement with the first cams,

a second horizontal shaft rotatably mounted in the frame over the conveyor and extending adjacent to one sides of the swing arms,

a pair of second cams mounted on the second shaft,

a pair of second cam followers mounted on the swing arms for engaging the respective second cams,

spring means for biasing the swing arms toward the second shaft to engage the second cam followers with the second cams,

said first and second pairs of cams being designed for moving the holder and wire cutting element in a generally D-shaped path of movement including a substantially straight vertically downward portion of movement to engage the wire cutting element with the conveyor surface to sever a slice from the log and a return portion of movement beginning in a substantially forward horizontal movement at the end of the downward movement and ending in a rearward movement to return to the path of downward movement,

drive means for rotating the first and second shafts in synchronism,

said drive means and said first and second pairs of cams being selected in conjunction with the speed of the conveyor so that the wire cutting element is disengaged and

remains disengaged from the advancing newly formed edge of the log during the return movement, and

means for assisting in discharge of the slice from the end of the log.

4,488,465

METHOD AND APPARATUS FOR CUTTING OPEN-FLANKED OR OPEN-SIDED V-BELTS

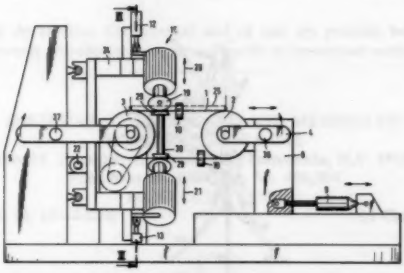
Wilhelm Brand; Hans Hersing, and Dietmar Baasner, all of Hanover, Fed. Rep. of Germany, assignors to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Jul. 7, 1982, Ser. No. 395,924

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1981, 3128110

Int. Cl.³ B29H 7/22

U.S. Cl. 83—175 **1 Claim**



1. An apparatus for cutting open-flanked V-belts from a tubular, vulcanized roll formed from a plurality of layers of rubber and reinforcements comprising:

(a) support means for said roll, said support means comprising a pair of drivable rollers, at least one of said rollers being capable of being axially displaced in a parallel manner with respect to the other of said rollers, said displacement of said at least one roller away from said other roller causing said roll to be tensioned and causing at least a part of the displacement of said belt to occur in straight lines,

(b) means for axially displacing said at least one roller so as to tension said roll,

(c) means for rotating said rollers,

(d) a pair of cutter means mounted generally opposite each other and exteriorly of and between the axes of said rollers, each of said cutter means including a single circular cutter blade, means for rotating said cutter blades, and adjustment means operatively connected to each of said cutter blades for simultaneously moving said blades into engagement with said roll for cutting oppositely angled flank cuts in said roll to form a series of V-belts, and away from engagement with said roll after said cuts have been completed,

(e) abutment means positioned between said rollers and co-operable with said circular cutter blades, said abutment means being disposed within and supporting said roll when said roll is located on said rollers, and

(f) means for intermittently and simultaneously moving said pair of cutter means a predetermined distance in a direction parallel to the axes of said rollers when said cutter blades are disengaged so as to position said blades for the next cut, after which said adjustment means can be actuated to move said cutter blades into engagement with said roll to effect additional flank cuts in said roll.

4,488,466

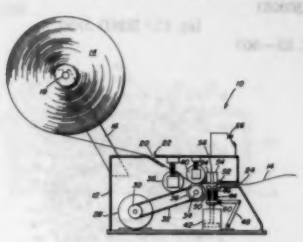
APPARATUS FOR CUTTING SHEET MATERIAL

William C. Jones, East Sandwich, Mass., assignor to Seal Tech Corp., Wareham, Mass.

Filed Sep. 7, 1982, Ser. No. 414,977

Int. Cl.³ B26D 7/14

U.S. Cl. 83—175 **13 Claims**



1. A sheet-cutting and -dispensing apparatus, which apparatus comprises:

(a) support means to support a source of sheet material to be dispensed and cut by the apparatus;

(b) drive means to move the sheet material from the support means along a predetermined, directional flow path toward an outlet, where the cut sheet material is to be dispensed;

(c) a first pair of laterally spaced-apart, sheet-retainer means characterized by an air space therebetween and positioned adjacent the directional flow path of the sheet material;

(d) a second movable pair of laterally spaced-apart, sheet-retainer means aligned generally opposite the first pair of retainer means and on the opposite side of the directional flow path of the sheet material, to define a sheet-movement space between the first and second retainer means for the directional flow movement of the sheet material, when the first and second retainer means are in a nonsheet-retaining position;

(e) a cylinder means including a piston for reciprocating movement;

(f) a sheet-cutting means secured for reciprocating movement with the piston between a sheet-cutting and a -noncutting position and positioned between the second retainer means;

(g) the second retainer means secured for reciprocating movement with the piston between a sheet-retaining position, wherein the first and second retainer means retain the sheet material in a fixed, generally taut condition therebetween, and a nonsheet-retaining position, wherein the sheet material is free to move in the sheet-movement space and to move along the directional flow path;

(h) control means to provide for the reciprocating movement of the piston between

(i) a nonsheet-retaining position, whereby the sheet material may move along the directional flow path from the means to support to the outlet,

(ii) a sheet-retaining position, whereby the first and second retainer means are positioned to retain the sheet material therebetween in a taut condition across the air space, and

(iii) a sheet-cutting and -retaining position, whereby the cutting means cuts the taut, retained sheet material and moves into the air space, the control means providing for the dispensing of a desired amount of sheet material by the drive means, and the preselected, timed, sequential control of the piston between the noncutting and retaining position, the sheet-retaining position and the sheet-cutting position.

4,488,467

APPARATUS FOR CUTTING OPENINGS IN PIPES

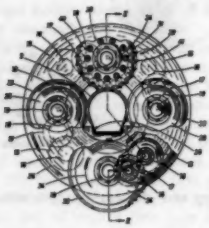
Wilhelm Hegler, Goethestrasse 2, D-8730 Bad Kissingen, and Ralph-Peter Hegler, Bad Kissingen, both of Fed. Rep. of Germany, assignors to Wilhelm Hegler, Bad Kissingen, Fed. Rep. of Germany

Filed Dec. 27, 1982, Ser. No. 453,468

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1982, 3200081

Int. Cl.³ B26D *5/08*

U.S. Cl. 83—303 7 Claims



1. Apparatus for cutting openings in the was of a pipe of cuttable material, the outer periphery of the wall of the pipe being at least in part annularly corrugated, comprising:

(a) at least one cutter head having helically extending ridges for engaging in the annular corrugations of the pipe;

(b) at least one cutter mounted on the cutter head parallel to the helically extending ridges;

(c) planetary gear means for positively driving the cutter head so that it rolls at least in part on the outer periphery of the pipe and the cutter edge of the cutter moves around the pipe on an epitrochoidal path;

(d) at least one support rollwe for abutting the pipe wall to take up thrust forces;

(e) mounting means for support roller;

(f) a shaving head for severing a chip previously cut by the cutter having helically extending ridges for engaging in the annular corrugations of the pipe; with the planetary gear means being adapted to positively drive the shaving head with slippage relative to the pipe.

4,488,468

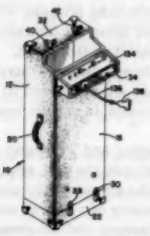
ELECTRONIC MUSICAL INSTRUMENT AND COMPACT PEDAL BOARD AND STORAGE CASE THEREFOR

Richard H. Peterson, 11748 Walnut Ridge Dr., Palos Park, Ill. 60464; Patrick J. Bovenizer, Alsip; Richard W. Jensen, Elmhurst, and William H. Hass, Hickory Hills, all of Ill., assignors to Richard H. Peterson, Palos Park, Ill.

Filed Jun. 9, 1981, Ser. No. 271,762

Int. Cl.³ G10H *1/34*

U.S. Cl. 84—1.01 17 Claims



1. An electronic musical instrument comprising:

a compact, portable pedal board;

an elongated storage case adapted to removably receive said pedal board, said storage case including at one end a pedal board access door and at the opposite end a control panel door;

electronic circuit means controllable by said pedal board for electronically producing music, said circuit means being mounted within said storage case;

a control panel for said circuit means, said control panel being mounted on said control panel door for display when said control panel door is open; and

cable means for connecting said pedal board and said control panel to said electronic circuit means.

4,488,469

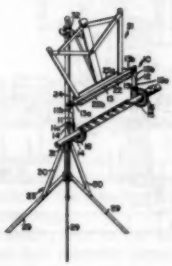
MUSICAL INSTRUMENT HOLDER

Xavier J. Demello, and Deborah K. Pennington, both of 1145 Hague Ave., Saint Paul, Minn. 55104

Filed Feb. 18, 1982, Ser. No. 349,985

Int. Cl.³ G10G *5/00*

U.S. Cl. 84—385 A 3 Claims



1. A holder for a musical instrument for use with a sheet music stand, the stand having a ledge for supporting sheet music, the ledge having a top surface, said holder comprising:

(a) a first and second support members each having first and second ends;

(b) a first holding device attached to said first end of said first support member and a second holding device attached to said first end of said second support member, said holding devices being shaped to hold said musical instrument;

(c) means for supporting said second ends of said support members, said supporting means comprising a cross support member pivotally connected to said second ends of said first and second support members, said cross support member being adapted to rest on said music stand ledge; and

(d) said first and second support members extending generally downward from said cross support member when in position to hold said musical instrument and folding adjacent said cross support member when in position to be transported,

whereby said holder can readily be raised from said ledge without requiring the loosening of a threaded fastener and independently transported.

4,488,470

DRUM STICKS

James A. Larrain, 103 Greenbrook Dr., Brandon, Miss. 39042

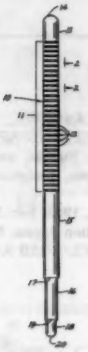
Filed Sep. 24, 1982, Ser. No. 422,549

Int. Cl.³ G10D *13/02*

U.S. Cl. 84—422 S 11 Claims

1. Drum stick, comprising a shaft of circular cross sections having plural stepwise reductions in diameter from the largest diameter handle portion at one end to the smallest diameter tip portion at the other end, each said portion along the length of

the drum stick being of uniform cylindrical shape, there being at least three said portions including said handle portion and



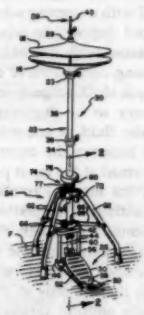
said tip portion, the terminal end of said tip portion, being convexly rounded to provide a smooth drum-contact surface.

4,488,471

HIGH-HAT CYMBAL STAND AND METHOD OF SETTING UP THE SAME

Phillip M. Youakim, 122 Dexter St., Tonawanda, N.Y. 14150

Filed May 19, 1983, Ser. No. 496,204
Int. Cl.³ G10D *13/00*
U.S. Cl. 84—422 R **15 Claims**



1. In a high-hat cymbal stand including a support pipe, a leg assembly for supporting said pipe upright in a generally perpendicular orientation relative to a floor or similar supporting surface, said leg assembly including a plurality of legs and a coupler to which each leg is connected, said coupler being received about said pipe for sliding movement relative to and along the length of said pipe, means for releasably locking said coupler to said pipe at a selected position along the length of said pipe, and a pedal assembly including a weight-supporting member for engaging the floor and for supporting at least a portion of the weight of said stand when said stand is set up, said weight-supporting member being connected to said support pipe for movement therewith as said pipe is moved relative to said coupler, the improvement comprising:

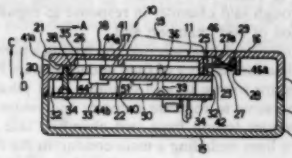
biasing means for imposing a force between said leg assembly and said support pipe so that when said stand is placed upright upon a floor and said support pipe and said coupler are permitted to move relative to one another, said biasing means hold said weight-supporting member in opposition to the gravitational bias thereof and in spaced relationship with the floor.

4,488,472

KEYBOARD MUSICAL INSTRUMENT

Shinji Kumano, and Masao Kondo, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka, Japan

Filed Apr. 16, 1982, Ser. No. 369,195
Claims priority, application Japan, May 1, 1981, 56-66747
Int. Cl.³ G10C *3/12*
U.S. Cl. 84—434 **8 Claims**



1. A keyboard musical instrument which comprises:

(a) a casing having a retaining groove and a key stop portion;

(b) a plurality of juxtaposed keys mounted on said casing for movement between raised and lowered positions, each key having a retaining portion engageable with said key stop portion to limit the upward movement of said key;

(c) a resilient leaf formed integral with each key and extending rearwardly therefrom, said resilient leaf normally urging each key into its raised position, said resilient leaf having an engaging section at its rear portion, and said engaging section being detachably retained in said retaining groove; and

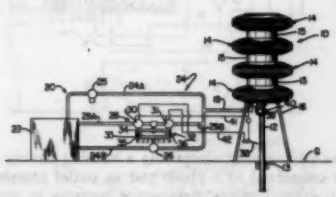
(d) guide means formed on said casing immediately adjacent to and forward of said retaining groove, said engaging section being insertable into said retaining groove by first being engaged with said guide means and moved rearwardly along said guide means to the end thereof.

4,488,473

FLUID-ACTUATED RAM

Jimmie L. Gammon, Fairfield, Ill., assignor to Liquid Power, Inc., Fairfield, Ill.

Filed Feb. 12, 1982, Ser. No. 348,202
Int. Cl.³ F01L *15/02*
U.S. Cl. 91—50 **14 Claims**



1. A fluid-actuated working head adapted to impart reciprocal motion under a predetermined force to a ram through a working and return cycle at a controllable rate of speed wherein delivery and return lines extend between a source of fluid under pressure and said working head, said working head comprising:

a plurality of annular flexible casings, each of generally toroidal configuration with opposite sidewalls terminating in mutually opposed, inner bead-like edges, interconnecting means extending between said inner bead-like edges of adjacent casings operative to interconnect said casings in sealed, coaxially spaced relation to one another, closure means at opposite ends of said plurality of casings defining a common sealed chamber therebetween, support means fixing one end of said chamber against movement as said

chamber undergoes axial expansion and contraction with respect to said fixed end, and said ram mounted to follow the movement of said opposite end of said chamber as said chamber undergoes expansion and contraction in response to the delivery and return of fluid under pressure to and from said chamber through said delivery and return lines, said ram defined by a plunger extending through said chamber for connection to said opposite end of said chamber, and centering means associated with said interconnecting means through which said ram is inserted whereby to center said plunger for axial movement centrally through said chamber in response to expansion and contraction of said chamber; and

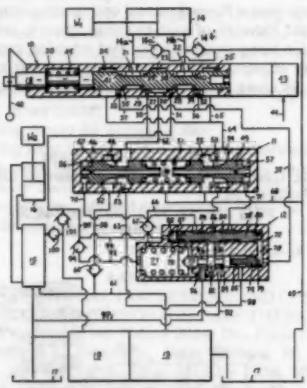
a fluid control circuit characterized by having a pump in said delivery line for delivery of fluid under pressure from said fluid pressure source to said chamber, and pilot control means operative to regulate delivery and return of fluid under pressure to and from said chamber, said delivery and return lines including a main conduit in the form of a loop, a common conduit extending from said loop for connection to said chamber, and said pilot control means including a conduit extending between said loop and said fluid reservoir.

4,488,474

FULLY COMPENSATED FLUID CONTROL VALVE

Tadeusz Budzich, Moreland Hills, Ohio, assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 17, 1983, Ser. No. 458,508
Int. Cl.³ F15B *13/02*
U.S. Cl. 91—446 **12 Claims**



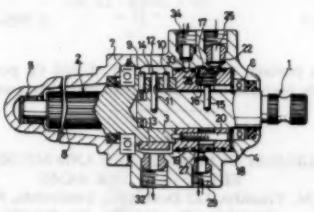
1. A valve assembly comprising a housing having an inlet chamber connected to a pump and an outlet chamber connected to exhaust means, first means operable to selectively communicate said inlet and said outlet chambers with a fluid motor, first control orifice means interposed between said inlet chamber and said fluid motor, second control orifice means interposed between said fluid motor and said exhaust means, positive load fluid throttling means between said inlet chamber and said pump, and negative load fluid throttling means between said outlet chamber and said exhaust means, said positive and said negative load fluid throttling means controllable by a fluid power amplifying and control means, and control signal diverting means interposed between said fluid power amplifying and control means and said positive and negative load fluid throttling means, said fluid power amplifying and control means operable to (i) throttle fluid flow by said positive load fluid throttling means to maintain a relatively constant pressure differential across said first control orifice means and (ii) to throttle fluid flow by said negative load fluid throttling means to maintain a relatively constant pressure differential across said second control orifice means.

4,488,475

POWER STEERING APPARATUS

Naosuke Masuda; Yoshio Suzuki, and Tadaaki Fujii, all of Higashimatsuyama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Feb. 24, 1983, Ser. No. 469,376
Claims priority, application Japan, Mar. 15, 1982, 57-40456
Int. Cl.³ F15B *9/10*
U.S. Cl. 91—462 **9 Claims**



1. A power steering apparatus having an input portion and an output portion and comprising: an input shaft at said input portion and associated with a steering wheel, an output shaft at said output portion and disposed in axial alignment with the input shaft and associated with steerable road wheels, and a control valve comprising control valve elements mounted on the input and the output shaft, respectively, the control valve controlling the delivery to or displacement from a power cylinder of a hydraulic fluid in accordance with a relative angular displacement between the control valve elements, a pair of mating parts formed at the input portion and the output portion, respectively, for integral rotation therewith, and a spring having a substantially C-shaped configuration engageable at its circumferential ends with the mating parts, the resilience of the spring maintaining the mating parts in position, in which the C-shaped spring is varied in cross-sectional configuration between its said ends so that stresses produced therein are substantially uniform throughout the spring, said control valve being of disc type comprising a plurality of disk like control valve elements axially aligned with each other and with said C-shaped spring.

4,488,476

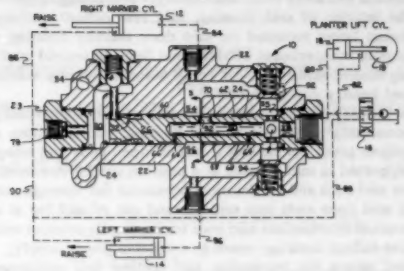
MARKER CONTROL VALVE

Robert M. Diel, Hutchinson, and Richard C. Putnam, Nickerson, both of Kans., assignors to The Cessna Aircraft Company, Wichita, Kans.

Filed Oct. 27, 1982, Ser. No. 436,910
Int. Cl.³ F15B *11/20*
U.S. Cl. 91—513 **8 Claims**

8. A sequencing valve as set forth in claim 2, wherein the valve spool means includes two spaced balancing areas on one side of the spool means with an equivalent third balancing area on the opposite side of the spool means, all three of which are

connected by passage means whereby any pressure in the third balancing area is transferred to the first and second areas on the



opposite side thereof so as to equalize the lateral pressure load on the spool.

4,488,477

RODLESS CYLINDER

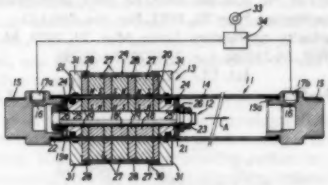
Michikazu Miyamoto, Soka, Japan, assignor to Shoketsu Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 25, 1982, Ser. No. 436,367

Claims priority, application Japan, Nov. 19, 1981, 56-172476[U]

Int. Cl.³ F01B *11/02*

U.S. Cl. 92—85 R **7 Claims**



1. A rodless cylinder, in which a driving member driven within a cylinder in the axial direction by the pressure of a fluid is constituted by mounting a driving magnet row to a piston sliding in said cylinder and a driven member disposed to the outer circumference of said cylinder axially slidably is mounted with a driven magnet row, wherein a plurality of individual magnets disposed axially to the cylinder in each of said magnet rows are arranged such that the identical poles of said individual magnets are adjacent to each other, and each of said magnet rows are arranged such that the different poles of said individual magnets are opposed to each other.

4,488,478

CONTINUOUS FRYER FOR POTATO CHIPS AND OTHER SNACK FOODS

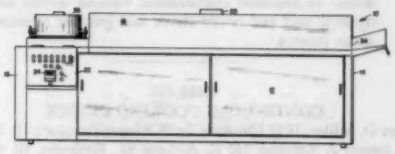
Alan L. Leeper, Manchester, N.H., assignor to J. C. Pitman Company, Inc., Concord, N.H.

Filed Jul. 8, 1983, Ser. No. 511,985

Int. Cl.³ A47J *37/12*

U.S. Cl. 99—330 **8 Claims**

1. A continuous fryer for potato chips and other particulate foods comprising housing including an elongated kettle adapted to contain a bath of hot cooking oil and a hood, said housing having an entrance port for admitting foods to be fried and an exit port for expelling fried foods at opposite ends thereof, said kettle extending substantially the length of said housing between said ports; a conveyor assembly and drive means therefore pivotally mounted on said housing comprising paddle means disposed within said housing adjacent the entrance port for advancing foods to be fried, admitted through the entrance port, and for dispersing foods to be fried in the bath of cooking oil, delivery means disposed adjacent the exit port for removing fried foods from the oil bath and delivering the foods through the exit port, and submersion conveyor means disposed within said kettle for conveying foods to be cooked through the oil bath from said paddle means to said delivery means, said conveyor assembly means further comprising a pair of elongated, upstanding sidewalls, an endless belt rotatably mounted between said side walls and extending along the central portion thereof; and a plurality of mutually spaced flytes mounted on the external surface of said belt; said sidewalls being dimensioned to suspend said belt at a predetermined height within said kettle when said assembly is disposed therein; and



pivot actuator means coupled by said housing and said assembly for simultaneously raising and lowering said paddle means, submersion conveyor means and delivery means as an assembly relative to said kettle and oil bath therein so that said assembly may be raised out of said kettle for cleaning and subsequently returned thereto for cooking by causing said assembly to pivot about said mounting on said housing, said drive means for said conveyor assembly being coupled thereto by a flexible coupling permitting pivotal movement thereof between a first position wherein said belt is horizontal and a second position wherein said belt is disposed at an acute angle to the horizontal.

4,488,479

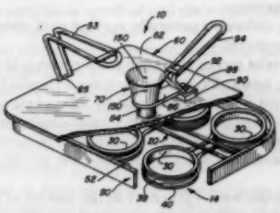
PORTABLE APPARATUS FOR COOKING EGGS ON A HEATED COOKING SURFACE

Norman R. Sloan, New Lenox; Dionizas Remys, Clarendon Hills, and Robert A. Novy, LaGrange Park, all of Ill., assignors to Restaurant Technology, Inc., Oak Brook, Ill.

Filed Feb. 3, 1984, Ser. No. 576,573

Int. Cl.³ A47J *29/00*

U.S. Cl. 99—345 **9 Claims**



1. A portable apparatus for cooking eggs on a heated grill, said apparatus comprising:

(a) a portable base assembly for being disposed on said grill, said base assembly including (1) a peripheral wall for being disposed on said grill and having an upper edge, (2) a plurality of rings for being disposed on said grill and that are each adapted to receive a shelled egg therein, and (3) frame means for carrying said rings within said peripheral wall;

(b) a removable closure assembly adapted to be received on said base assembly, said closure assembly including (1) a

cover at least coextensive with said peripheral wall and adapted to be seated on said upper edge, (2) an open top container mounted on said cover and defining a reservoir for receiving a predetermined quantity of water therein, and (3) means for defining an unobstructed orifice through said cover and communicating with the interior of said container for metering said water at a predetermined rate onto said grill; and

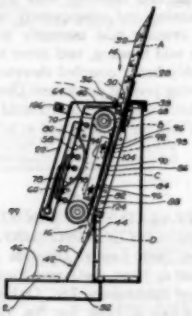
(c) the relationship between said base assembly and said closure assembly being effective to (1) locate said orifice means to meter said water onto an area of said grill within said peripheral wall but exterior of all of said rings, (2) provide space between the top of each said ring and said cover to permit steam generated from said water metered onto said grill to flow into the interior of said rings, and (3) define an enclosed containment volume within said peripheral wall and cover above said grill for retaining the steam therein.

4,488,480

CONTINUOUS COOKING DEVICE

Dye O. Miller, 1815 Pheasant Trail, Mount Prospect, Ill. 60056; August J. Antunes, 143 E. Jackson St., Elmhurst, Ill. 60126, and Jerome Antunes, 21 Clubside Dr., Clarendon Hills, Ill. 60514

Filed Oct. 14, 1982, Ser. No. 434,347
Int. Cl.³ A47J *37/00*
U.S. Cl. 99—386 **1 Claim**



1. An automated cooking device for simultaneously broiling and grilling meat products such as hamburgers or the like, said device comprising:

a housing defining a generally vertical path of travel for said meat products;

an upper inlet means including a top opening in said housing and an upwardly and rearwardly extending inlet guide means for directing said meat products into said opening, said inlet guide means being substantially longer in the feed direction than said meat products to permit the stacking thereof of a plurality of said meat products for cooking;

a lower outlet means generally at the bottom of said housing including a storage area adjacent thereto for receiving and accumulating cooked meat products;

an endless belt chain conveyor, mounted within said housing and arranged to convey said meat products from said inlet means to said outlet means, said conveyor having opposed first and second sides;

a first radiant cooking means mounted within said housing adjacent to the first side of said conveyor for generating radiant heat to broil one side of said meat product as they are conveyed from said inlet means to said outlet means;

a second contact cooking means, mounted in said housing adjacent the second side of said conveyor for contacting and grilling said meat products on the side opposite the broiled side thereof as the meat products are conveyed from said inlet means to said outlet means;

a door mounted on said housing for pivotal movement toward and away from said conveyor permitting access to the interior of said housing, said first radiant cooking means being mounted on said door thereby defining a heating compartment between said first and second cooking means, said conveyor being mounted wholly within said heating compartment;

door mounting means mounted on said housing for pivotally connecting said door to said housing, and including a hollow pivot bar having a pair of open ends and being supported in said housing at a position spaced intermediate said ends and an electrical connector fed through one of said open ends into said bar and out of said bar at a position intermediate said ends to electrically connect said first radiant cooking means to a suitable power supply;

spring means for tensioning said endless belt conveyor mounted on said door for engaging said endless belt conveyor when the door is closed and maintaining a predetermined tension therein; and

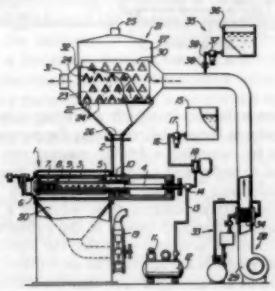
adjustable guide means mounted on the housing adjacent the endless belt chain conveyor to permit the size of the passageway between said conveyor and said second contact cooking means to be adjusted.

4,488,481

APPARATUS FOR PRODUCING RICE OF SUPERHIGH GLOSS

Toshihiko Satake, Higashihiroshima, Japan, assignor to Satake Engineering Co., Ltd., Tokyo, Japan

Division of Ser. No. 128,388, Mar. 10, 1980, abandoned. This application May 20, 1982, Ser. No. 380,123
Claims priority, application Japan, Mar. 19, 1979, 54-31005; Mar. 19, 1979, 54-31006; Apr. 3, 1979, 54-39350
Int. Cl.³ A23B *9/00*
U.S. Cl. 99—517 **8 Claims**



1. Apparatus for producing rice grains having superhigh gloss, comprising:

a vessel having an inlet port, an outlet port, and a delivery passage between said inlet and outlet ports to allow rice grains to pass from said inlet port to said outlet port;

air supply means openly connected to said delivery passage for supplying cooling and humidifying air thereinto and into direct contact with the rice grains flowing through said delivery passage, so as to cool and harden and simultaneously to humidify such rice grains to prevent cracks from being developed on the surface thereof;

a frame;

a perforated cylindrical member mounted on said frame; and

a polishing roll rotatably mounted on said frame and disposed within said perforated cylindrical member in generally concentric relation thereto; said polishing roll and said perforated cylindrical member defining therebetween

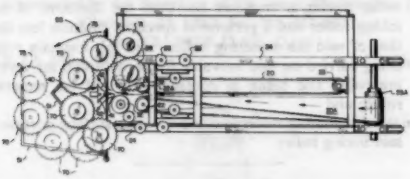
a polishing chamber communicating with said outlet port of said vessel so that the rice grains cooled and humidified in said delivery passage may be supplied into said polishing chamber.

4,488,482

METHOD AND APPARATUS FOR EXTRACTING ALOE VERA GEL

Thomas A. Cottrell, 2306 Briarwood, Mission, Tex. 78572

Filed Dec. 6, 1982, Ser. No. 447,429
Int. Cl.³ B30B 9/20
U.S. Cl. 100—37 7 Claims



1. A device for extracting aloe vera gel from within the fibrous husks of harvested aloe vera leaves, said device comprising:

a frame;

a blade connected to said frame;

drive means for a source of rotary power attached to said frame;

means for feeding said aloe vera leaves to and through said blade whereby said leaves are longitudinally bisected to expose the gel over substantially the entire length of each leaf, said means for feeding connected to said frame and linked to said drive means;

a block hingedly mounted on said frame;

twin pairs of pressing rollers, said pressing rollers rotatably mounted on said block, said block having a first position which links said pairs of pressing rollers to said drive means and presents said pairs of pressing rollers in position to receive opposing halves of said longitudinally bisected aloe vera leaves, whereby said longitudinally bisected aloe vera leaves are pressed between rollers which advance the husks through the rollers but do not pass the gel, and further, said block having a second position disengaged from said drive means in which said pressing rollers are swung away from said blade whereby said pair of pressing rollers and said blade are accessible for safe cleaning; and

means for collecting said aloe vera gel while separating from said husks at said pressing rollers.

6. A method for extracting aloe vera gel from within fibrous husks of aloe vera leaves said method comprising the following steps;

washing the harvested aloe vera leaves;

trimming the ends of the aloe vera leaves;

feeding washed and trimmed aloe vera leaves to and through a blade whereby the leaves are longitudinally bisected to expose the gel over entire length of each leaf;

pressing the longitudinally bisected leaves in paired pressing rollers which advance the husks through the rollers but do not pass the gel;

collecting the gel separated from said husks at said pressing rollers into a collection pan

collecting said husks for disposal; and

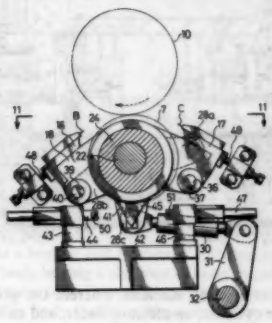
frequently cleaning the processing equipment by swinging a hinged block upon which said pressing rollers are rotatably mounted away from said blade thereby permitting access to the blade and the pressing rollers, and at the same time, disengaging said pressing rollers from drive means whereby safe cleaning opportunities are maximized.

4,488,483

MULTICOLOR ROTARY PRINTING PRESS

Yuji Kohara, Tokyo, Japan, assignor to Kabushiki Kaisha Tokyo Kikai Seisakusho, Tokyo, Japan

Filed May 31, 1983, Ser. No. 499,556
Claims priority, application Japan, May 31, 1982, 57-080126[U]; May 31, 1982, 57-080127[U]
Int. Cl.³ B41F 5/18, 31/04
U.S. Cl. 101—178 6 Claims



1. A multicolor rotary printing press rotatable selectively in a normal or reverse direction comprising:

(a) a single impression cylinder;

(b) a plurality of plate cylinders disposed around and held against said single impression cylinder for passing a web of print paper successively between said impression cylinder and said plate cylinders to effect multicolor printing on said web; and

(c) ink supply means associated respectively with said plate cylinders, each of said ink supply means including:

(1) a fountain roller rotatable at a peripheral speed lower than a peripheral speed of said plate cylinder for picking up ink from an ink pan;

(2) inking rollers held in contact with said plate cylinder for supplying ink to said plate cylinder;

(3) a mesh roller held against said inking rollers and rotatable at the same peripheral speed as that of said plate cylinder, said mesh roller being spaced slightly from said fountain roller and having minute recesses defined in a peripheral surface thereof;

(4) a pair of first and second doctor blades disposed in symmetrical locations one on each side of a position in which said mesh roller is disposed adjacent to said fountain roller, and having distal ends confronting and pressable against said mesh roller;

(5) switch means for independently displacing said doctor blades between a first position in which said doctor blades are pressed against said mesh roller and a second position in which said doctor blades are spaced from said mesh roller;

(6) a system for driving all of said cylinders in the normal or reverse direction; and

(7) clutch means for switching said system to rotate said cylinders selectively in the normal or reverse direction.

4,488,484
CONTROL DEVICE FOR OFFSET PRINTING CYLINDERS HAVING ADJUSTABLY MOUNTED ECCENTRIC SHAFT

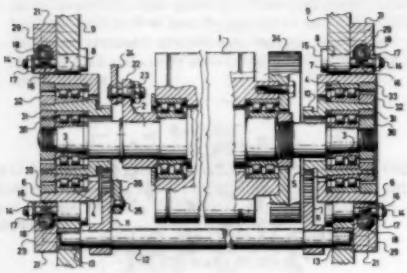
Jaroslav Jiruse, Blansko, and Zbynek Liska, Adamov, both of Czechoslovakia, assignors to ZVS Adamovske strojirny koncernovy podnik, Adamov, Czechoslovakia

Filed Jun. 1, 1983, Ser. No. 499,809

Claims priority, application Czechoslovakia, Jun. 1, 1982, 4044-82

Int. Cl.³ B41F *13/24*

U.S. Cl. 101—248 **11 Claims**



1. In an offset printing machine wherein the printing unit includes a plate cylinder, an offset cylinder, and an impression cylinder arranged in that order, the confronting surfaces of the plate cylinder and the impression cylinder being spaced a distance less than the diameter of the offset cylinder, and means for selectively moving the offset cylinder toward the plate and impression cylinders to exert printing pressure thereon and to move the offset cylinder away from the plate and impression cylinders to relieve them of printing pressure, the improved control device for the offset cylinder comprising means for rotatably mounting the offset cylinder on an eccentric shaft which is mounted in first adjustable bearings arranged on eccentric bushings, and second adjustable bearings mounted on said eccentric bushings, said second bearings being arranged in bearing flanges which are shiftably attached to side walls of the frame of the printing machine, said eccentric shaft being affixed to one end of a control lever, said control lever being joined by means of a pivot pin to a pull rod which is connected with the control mechanism of the printing machine.

4,488,485
SIMPLIFIED INKING UNIT

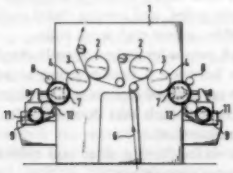
Hans-Bernhard Bolza-Schunemann, Wurzburg, Fed. Rep. of Germany, assignor to Koenig & Bauer Aktiengesellschaft, Wurzburg, Fed. Rep. of Germany

Filed May 24, 1983, Ser. No. 497,539

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1982, 3220926

Int. Cl.³ B41F *31/00*

U.S. Cl. 101—350 **1 Claim**



1. A simplified inking unit for use in a printing unit of a web-fed rotary printing machine to distribute a thinly liquid printing ink onto a letterpress printing plate carried on a rotatable plate cylinder which cooperates with a counter-pressure cylinder to print a web of paper, said simplified inking unit consisting of four rollers including:

a rotatable inking roller having a diameter and peripheral speed of rotation the same as the plate clyinder;

a finely screened, rotatable ink metering roller having a diameter and peripheral speed of rotation less than those of said inking roller, said ink metering roller being carried on a movable frame and being movable into and out of contact with said inking roller;

a rotatable ink fountain roller in contact with the thinly liquid printing ink in an ink fountain, said ink fountain roller having a diameter less than the diameter of said inking roller and a peripheral speed of rotation less than that of said ink metering roller, said ink fountain roller being carried on said movable frame with said ink metering roller and being in contact with said ink metering roller; and

an ink distributing roller in contact with a surface portion of said inking roller.

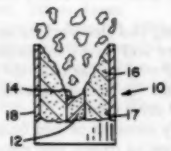
4,488,486
LOW BRISANCE DETONATING CORD

Robert E. Betts, 8107 Hogan Dr., Huntsville, Ala. 35802

Filed Dec. 16, 1982, Ser. No. 450,495

Int. Cl.³ F42B *3/10*

U.S. Cl. 102—275.1 **3 Claims**



1. A detonating cord of low brisance comprising:

a. An outer core of explosive material of predetermined detonating velocity, and

b. An inner core of explosive material concentrically carried in said outer core and in contiguous relationship therewith, said inner core having a detonating velocity higher than that of said outer core, said inner core disposed for transmitting detonation waves of predetermined velocity to said outer core, said outer core being defined by a sheath enclosing a first explosive, and said inner core including a second explosive carried in a central opening of said first explosive.

4,488,487
STEPPED BODY PENETRATION BOMB

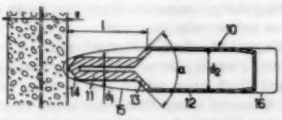
Pierre C. Croizer, Elancourt, France, assignor to MATRA, Paris, France

Filed Jan. 5, 1983, Ser. No. 455,841

Claims priority, application France, Jan. 8, 1982, 82 00253

Int. Cl.³ F42B *25/20, 25/08*

U.S. Cl. 102—382 **12 Claims**



1. A penetration bomb comprising a resistant body having a front part of smaller diameter and thicker wall and a rear part

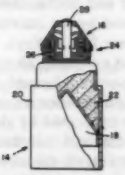
of greater diameter and thinner wall, connected by an intermediate portion arranged for transmitting engagement forces from said rear part to said front part on impact, and an explosive charge in both said parts, wherein the explosive filling coefficient of the front part is much lower than that of the rear part.

4,488,488

WARHEAD SAFETY AND RIBBON CHUTE HOLDER

Lonnie L. Looger, Madison, and Gerald S. Smith, Huntsville, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 23, 1982, Ser. No. 452,487
Int. Cl.³ F42B 25/02, 25/22
U.S. Cl. 102—387 4 Claims



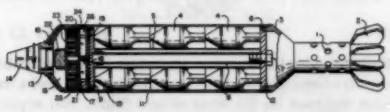
1. In a warhead disposed for impact with a target, said warhead including an igniter for detonation thereof and a chute for stabilizing said warhead in flight to said target, a device for releasably retaining said chute on said warhead and for cooperating with said igniter to prevent accidental detonation thereof prior to impact with said target, said device being a clip member having four legs spaced 90° apart for straddling said chute for retention thereof in a folded relation on said igniter.

4,488,489

ORDNANCE SYSTEM HAVING A WARHEAD WITH SECONDARY ELEMENTS AS A PAYLOAD

Rainer Schöffl, Odenthal, Fed. Rep. of Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Dec. 15, 1981, Ser. No. 330,850
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048617
Int. Cl.³ F42B 13/24, 13/50, 25/16
U.S. Cl. 102—489 23 Claims



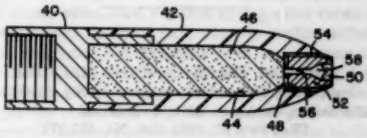
1. An ordnance system including a wing-stabilized warhead accommodating a plurality of secondary elements forming a payload, characterized in that propulsion means are coaxially disposed in the warhead for producing a high speed rotation of the warhead about a longitudinal axis thereof, the propulsion means being enabled at a time subsequent to launching of the warhead along a portion of the flight path for producing the high speed rotation of the warhead so as to enable distribution of the secondary elements, the propulsion means producing the high speed rotation of the warhead directly before a release of the secondary elements.

4,488,490

PERCUSSION INITIATED SPOTTING CHARGE

Robert E. Betts, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 29, 1983, Ser. No. 527,714
Int. Cl.³ F42B 11/16
U.S. Cl. 102—513 4 Claims



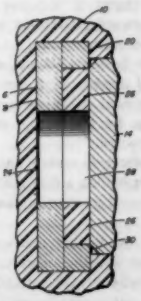
1. A rocket having a percussion initiated spotting charge comprising a head closure, and elongated body secured to said head closure and having a chamber defined therein and having an outer surface that is tapered inwardly at the leading front end thereof, a pyrotechnic spotting charge positioned in and filling said chamber of said elongated body, said elongated body having a bore opening in the leading and front end thereof and extending to said chamber, a percussion primer mounted in a leading end portion of a malleable body and said malleable body having a chamber defined therein and having a passage therein from the chamber thereof to a remote end of the malleable body that is adjacent said pyrotechnic spotting charge and a jacket on an outer radial surface of said malleable body and on an end of said malleable body remote from said percussion primer, said passage continuing through said jacket at said end and said malleable body and said jacket being secured in said bore opening of said elongated body with a portion of said jacket end in contact with said pyrotechnic spotting charge and an opposite leading end that projects beyond the front end of said bore opening, whereby when the rocket is launched toward a target and said percussion primer strikes said target, said percussion primer will be set off and the explosion thereof will be communicated through said chamber and said passage directly to the pyrotechnic spotting charge to in turn set off the pyrotechnic spotting charge.

4,488,491

AREA MULTIPLIER

Richard R. Rhodes, Stroudsburg, Pa., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 30, 1983, Ser. No. 480,442
Int. Cl.³ F42B 13/16
U.S. Cl. 102—522 4 Claims



1. In an improved plastic sabot provided penetrator having

an area multiplier, the improvement consisting essentially of an improved area multiplier for use in producing spin to said penetrator coincident with the spin of said sabot during launch, said area multiplier having a disc-like body embedded by molding in said sabot, said body having a peripheral portion provided with a series of projections for engagement with said projectile during launch for uniform spin, and said area multiplier separating from said projectile with the jettison of said sabot from said penetrator subsequent to launch.

4,488,492

RAILWAY TRACK TAMPING MACHINE

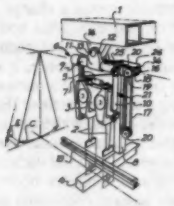
Jorg Ganz, Etoy, Switzerland, assignor to Sig. Societe Industrielle Suisse, Chutes du Rhin, Switzerland

Filed Feb. 25, 1982, Ser. No. 352,371

Claims priority, application Switzerland, Mar. 2, 1981, 1378/81

Int. Cl.³ E01B 27/16

U.S. Cl. 104—12 2 Claims



1. A railway track tamping machine having a rolling chassis adapted to roll on the rails of the railway track and at least one tamping unit mounted on said rolling chassis for tamping the ballast under the sleepers of the railway track, compising in combination:

(a) a gantry integrated in said tamping unit, said gantry being articulated to the rolling chassis;

(b) means for inclining said gantry with respect to the rolling chassis;

(c) a tool holder mounted in said gantry, said tool holder being movable upwardly and downwardly within said gantry;

(d) at least two oscillating and pivoting tamping tools mounted in opposition on said tool holder;

(e) motor means for causing the downward movement of the tool holder in the gantry and penetration of the tamping tools into the ballast;

(f) downward movement adjusting means for limiting said downward movement of the tool holder at a selected value, said downward movement adjusting means being connected to said motor means;

(g) a displacement detector associated to said gantry and tool holder, said displacement detector controlling said downward movement adjusting means;

(h) movable means for defining a zero position for said displacement detector;

(i) a mechanical feeler with neutral switchback position, said mechanical feeler having a first portion articulated to the gantry and a second portion in contact with the rolling chassis; and

(j) a transmission rod having one end connected to said mechanical feeler and the other end connected to said movable means, whereby the zero position of the displacement detector is automatically modified upon changes in the inclination of the gantry with respect to the rolling chassis.

4,488,493

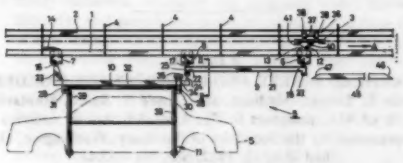
POWER-AND-FREE CONVEYOR

Takao Wakabayashi, Toyonaka, Japan, assignor to Nakanishi Metal Works Co., Ltd., Osaka, Japan

Filed May 12, 1983, Ser. No. 494,087

Int. Cl.³ B61B 10/02

U.S. Cl. 104—172 S 6 Claims



6. A power-and-free conveyor comprising a carrier including at least front, rear and intermediate free trolleys, a first connecting bar supported by the intermediate free trolley and one of the front and rear free trolleys, a rail provided on the first connecting bar and extending along the conveyor line, at least two roller trap portions formed in the rail and spaced apart by a predetermined distance longitudinally of the rail, a second connecting bar supported by the first connecting bar and the other of the front and rear free trolleys, and a roller supported by and spaced above the second connecting bar and rollingly movable along the rail.

4,488,494

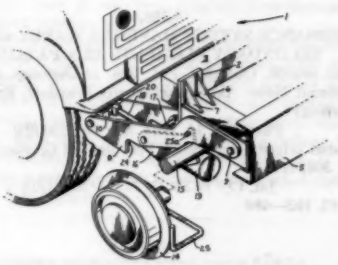
RAILWAY WHEEL CONVERSION APPARATUS FOR ROAD VEHICLES

Parks L. Powell, Sr., 660 Bankhead Hwy., Mableton, Ga. 30059

Filed Feb. 11, 1983, Ser. No. 465,809

Int. Cl.³ B61D 15/00; B61F 13/00

U.S. Cl. 105—215 C 7 Claims



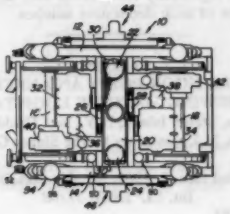
1. Railway wheel conversion apparatus for a road vehicle, said vehicle comprising a frame, suspension means, and a frame extension mounted on the front of said frame, said apparatus comprising a support arm attached at one end to said frame extension and extending generally rearwardly thereof and at the other end to said suspension means, a base plate pivotally connected to said support arm, a railway wheel axle secured to said base plate generally remote from the connection between said base plate and said support arm, a railway wheel rotatably mounted on said railway wheel axle, hydraulic cylinder means operably connected to said base plate so as to impart swinging movement thereto, a securing notch formed along the edge of said support arm, and a securing pin extending from said cylinder means and adapted to cooperate with said securing notch when said railway wheel is disposed in the extended position.

4,488,495

SOFT PRIMAR SUSPENSION SYSTEM FOR A RAILWAY CAR

Walter C. Dean, II, Collegeville, Pa., assignor to The Budd Company, Troy, Mich.

Filed Dec. 28, 1981, Ser. No. 334,987
Int. Cl.³ B61F 3/04, 5/30, 5/38
U.S. Cl. 105—224.1 1 Claim



1. In a railway truck having a side frame for receiving a journal bearing housing for carrying a wheel-axle unit,

a soft primary system disposed between said side frame and said journal bearing housing comprising:

(a) a pair of longitudinally disposed assemblies on opposite sides of said journal bearing housing;

(b) each of said assemblies including a plurality of laminated elastomeric strips separated by relatively thin metal strips to increase the shape factor of said elastomeric strips in compression making them stiffer in compression;

(c) said elastomeric and metal strips being oriented parallel to the vertical axis of said journal bearing housing and forming angle openings towards and away from the journal bearing housing to provide a low vertical spring rate;

(d) said angle openings being approximately at right angles to provide high and substantially equal longitudinal and lateral spring rates;

(e) a mechanical spring disposed over said journal box to support vertical loads thereon; and

(f) an elastomer member disposed within said mechanical spring to provide stop means to limit the movement of said journal bearing housing;

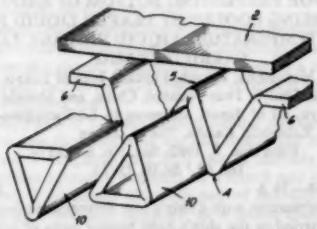
whereby said assemblies provide relatively high spring rates for lateral and longitudinal loads and low spring rates for vertical loads for equalization.

4,488,496

PLATFORM STRUCTURE OF THE PALLET TYPE

Giorgio Polacco, Via Arimondi, 2/2 - Padova, Italy

Filed Feb. 1, 1982, Ser. No. 344,664
Claims priority, application Italy, Feb. 6, 1981, 41522 A/81
Int. Cl.³ B65D 19/38
U.S. Cl. 108—51.3 4 Claims



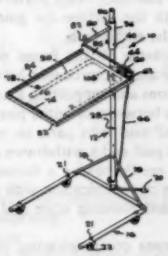
1. A platform structure of the pallet type having a lengthwise and a widthwise extension and on one side thereof a load bearing sheet structure with a load bearing face and a back face and on the opposite side thereof at least two leg formations defining therebetween entry ways for a lifting fork prong and wherein each leg formation is made of at least partly corrugated sheet material, wherein, according to the improvement, each said leg formation comprises a pair of spaced apart coplanar flat strip portions attached to said back face of said sheet structure, and between said flat strip portions and integral therewith two contiguous V-profiles extending lengthwise and parallel to each other, each V-profile having a free vertex edge at a distance from said back face, said two profiles defining a valley of triangular shape therebetween and opening away from said back face, the aperture of said valley being defined by the distance between the free vertex edges of said contiguous V-profiles and within said valley a triangular reinforcement inserted therein, said triangular reinforcement having its base side closing said aperture and cooperating with said free edges of said V-profile to define together therewith an increased resting surface for said platform structure, and to prevent deformation of said V-profile.

4,488,497

ADJUSTABLE TOOL TRAY

William J. Bevans, 9129 Summer Park Dr., Baltimore, Md. 21234

Filed May 5, 1982, Ser. No. 375,087
Int. Cl.³ A47B 9/00
U.S. Cl. 108—144 10 Claims



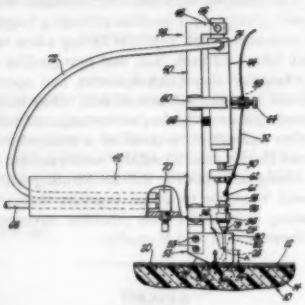
1. In an adjustable tool tray assembly for use in the automotive field, a vertical upstanding rigid support member having an upper end and a lower end with a series of spaced apart diametrical holes passing through the support member and each being generally parallel to the others; a "U" shaped rigid support bracket disposed horizontally relative to said support member at its lower end and connected to the vertical support member about a mid-point of a central section of the "U" shaped bracket; angulated rod members for bracing respective corners of the "U" shaped bracket with an intermediate portion of the vertical support member and forming a triangular support structure thereby; a pair of vertically adjustable sleeve members disposed in telescopic and sliding relation with respect to the vertical support member, each sleeve member having at least one diametrical hole passing therethrough, securing elements selectively extending through certain holes in the sleeve members and vertical support member for maintaining and retaining the sleeve members in their adjusted positions on the vertical support member; a generally "U" shaped rigid frame having a midpoint of its central section thereof supported from and operatively connected to an intermediate portion of one of the pair of sleeve members; a generally rectangularly configured tray means supportably mounted from the "U" shaped rigid frame, and a power outlet located on the back of the tray means.

4,488,498

APPARATUS FOR PRODUCING DECORATIVELY STITCHED TRIM PART

Jack E. Smith, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 16, 1983, Ser. No. 552,408
Int. Cl.³ D05C *15/00*
U.S. Cl. 112—80 **1 Claim**



1. A stitching machine to provide a line of sequential decorative stitches to the visible outer surface of a trim part with access available only to such outer surface, said stitches including a series of visible loops joined by a series of embedded loops, comprising,

a frame having a camming ramp portion and a foot portion engageable with the surface for guiding the frame forwardly along the stitch path,

an axial arm pivotable on the frame with respect to said camming ramp and reciprocable between extended and retracted positions and supporting a needle end for movement therewith between an initial piercing position at the outer surface of said trim part, an embedment position within the trim part and a withdrawn position outside the trim part, said needle having a thread receiving passage therethrough in communication with an open needle end having a forward piercing edge and a trailing notched edge,

thread supply means communicating with said thread receiving passage to provide thread exiting through the open end of the needle,

biasing means fixed with respect to said frame and acting to pivot the axial arm forwardly with respect to said camming ramp,

stop means fixed with respect to said frame and acting to limit the forward pivoting of the axial arm to a position in alignment with said camming ramp when said axial arm is reciprocated to its retracted position and acting to limit the movement of the needle end to its embedment position when said axial arm is reciprocated to its extended position and acting to limit the distance from said outer surface of the needle end in its withdrawn position when said axial arm is again reciprocated to its retracted position,

said axial arm initially engaging said camming ramp as said arm is reciprocated from its retracted position to its extended position as the thread is carried with the needle notched edge and the piercing edge initially pierces the outer surface of said trim part,

said axial arm continuing to engage the camming ramp as the arm moves the needle end to its embedment position while the notch edge continues to entrap the thread for movement with the needle end to said embedment position,

the camming engagement of said axial arm in cooperation with the needle embedment in said outer surface moving the foot portion of the frame forward an advancement distance along the stitch path equal to the length of a visible loop as said needle end is moved from its initial piercing position to its embedment position to embed said thread,

the embedment of said thread in cooperation with said stop means and the reciprocation of said axial arm controlling the amount of thread exiting through the open end of the needle to substantially equal the length of a visible loop and one half of the next embedded loop to provide sufficient thread for one decorative stitch,

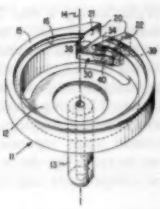
and means to repeatedly reciprocate said axial arm to provide a series of such decorative stitches.

4,488,499

REPLACEABLE HOOK POINT AND NEEDLE GUARD FOR SEWING MACHINE LOOP TAKER

Anthony Giaimo, Staten Island, N.Y., and Thaddeus J. Zylbert, Morris Plains, N.J., assignors to The Singer Company, Stamford, Conn.

Filed Dec. 2, 1981, Ser. No. 326,885
Int. Cl.³ D05B *57/08*
U.S. Cl. 112—230 **3 Claims**



1. A vertical axis sewing machine loop taker comprising a body portion including support means defining an axis of rotation therefor,

a circular rim extending from said body portion and having a center of curvature substantially coincident with said axis of rotation,

said circular rim being formed with a substantially radial slot with parallel sidewalls and a bottom surface which occupies a plane perpendicular to the axis of said loop taker,

an integral insert portion having opposite extremities formed with parallel surfaces spaced apart a distance equal to the width of said radial rim slot so that said integral insert may be slidably arranged therein for radial adjustment,

said insert portion being formed with a hook beak and with a needle guard rigidly disposed in predetermined relation to each other,

and fastening means for securing said insert portion in a fixed position in said rim slot of said loop taker body portion with said needle guard extending radially inwardly of said hook beak.

4,488,500

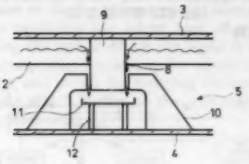
DEVICE FOR PREVENTING BOTTOM OF SHIPS HOLD FROM BEING COOLED BY LEAKED LIQUID FROM LOW TEMPERATURE LIQUID STORAGE TANK CARRIED BY SHIP

Kazumichi Mototsuna; Takashi Fujitani, both of Tokyo; Yoshito Okumura, Omiya; Iwao Nemoto, Chiba, and Shuichi Kitaguchi, Tokyo, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 8, 1983, Ser. No. 502,157
Int. Cl.³ B63B *25/16*
U.S. Cl. 114—74 A **2 Claims**

1. In combination with a ship's low temperature liquid storage tank carried in the ship's hold having pairs of horizontal displacement preventive tank supporting structures disposed between the bottom of the ship's hold and the bottom of the tank, a heat insulating layer surrounding the tank, and an en-

gaging member extending from the bottom of the tank and through said heat insulating layer to between said supporting structures, whereby gaps exist between said engaging member and said heat insulating layer, a leaked liquid receiving pan



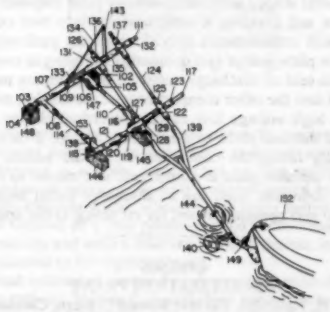
means disposed below the engaging member for receiving leaked liquid falling from said gaps, thereby to prevent the bottom of the ship's hold from being cooled by the leaked liquid.

4,488,501

MOORING DEVICE

Henry J. Kratt, 602 S. Erie, Tulsa, Okla. 74112

Filed Oct. 6, 1982, Ser. No. 432,982
Int. Cl.³ B63B *21/00*
U.S. Cl. 114—230 **5 Claims**



1. An adjustable mooring device suitable for attaching a floating facility to a fixed platform, the said device comprising a system of adjustable tubular members connected to each other by rotatable T couplings:

(a) a first pair of laterally spaced tubular members

(1) the said first pair of tubular members being mounted in a first pair of laterally spaced T couplings, rotatably mounted on a first shaft, the said first shaft being fixably attached to a fixed surface at two positions,

(2) the said first pair of laterally spaced tubular members extending from the said first pair of T couplings to a second pair of laterally spaced T couplings rotatably mounted on a second shaft,

(b) a second pair of laterally spaced tubular members extending from the said second pair of T couplings to a third pair of laterally spaced T couplings mounted on a third shaft,

(c) a fourth pair of laterally spaced T couplings mounted on the said third shaft,

(d) a third pair of laterally spaced tubular members extending in one direction from the said fourth pair of laterally spaced T couplings to a fifth pair of laterally spaced T couplings rotatably mounted on a fourth pair of laterally spaced T couplings to a fifth pair of laterally spaced T couplings rotatably mounted on a fourth shaft, the said third pair of laterally spaced tubular members extending in the opposite direction to a Y member, the said Y member being connected to means for securing the said floating facility, by the lower section of the said Y connection being supported at the water surface by a float; the said Y connection being connected by suitable means to the said floating facility,

(e) a fourth pair of laterally spaced tubular members extending from the said fifth pair of laterally spaced T couplings to a sixth pair of laterally spaced T couplings, the said sixth pair of laterally spaced T couplings being mounted on the said first shaft, and

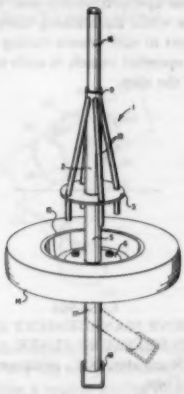
(f) a limiter positioned over the said second pair of T couplings.

4,488,502

MOORING DEVICE

William J. Girard, R.R. #1, Morrisburg, Ontario, Canada K0C 1X0

Filed Jun. 27, 1983, Ser. No. 507,632
Claims priority, application Canada, Dec. 29, 1982, 418665
Int. Cl.³ B63B *21/00, 21/54*
U.S. Cl. 114—230 **37 Claims**



21. A mooring device for cooperatively engaging a mooring ring, said device comprising:

circular plate means;

tubular shaft means, having first and second ends, perpendicularly passing through and fixed to said plate means;

guide means fixedly provided between the periphery of said plate means and a point on said shaft means spaced from said plate means in a direction towards said first end of the shaft means for guiding said ring member over and past said plate means; and

protruding means extending from the periphery of said circular plate means in a direction towards the second end of said shaft means, wherein said second end of said shaft means is adapted for securing said mooring device in a mooring position.

4,488,503

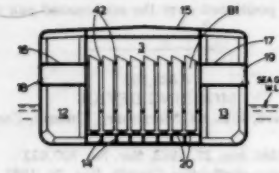
BARGE CARRYING SHIP AND METHOD OF LOADING SAME

Telemachus N. Galatis, 35 Berkeley Ct., Baker St., London, England

PCT No. PCT/GB82/00100, § 371 Date Nov. 30, 1982, § 102(e) Date Nov. 30, 1982, PCT Pub. No. WO82/03365, PCT Pub. Date Oct. 14, 1982
PCT Filed Mar. 31, 1982, Ser. No. 449,004
Claims priority, application United Kingdom, Apr. 6, 1981, 8110678
Int. Cl.³ B63B *35/40, 35/28*
U.S. Cl. 114—260 **9 Claims**

1. A method of loading a cargo transport ship with loaded elongate water-borne cargo-carrying vessels preparatory to

transportation of such cargo-carrying vessels by the ship, which method includes the steps of flooding a storage space within the transport ship, floating the cargo-carrying vessels into said flooded space, the improvement comprising swinging said vessels, while in the water, from their normal horizontal orientation into an orientation in which their longitudinal axes



are substantially vertical while maintaining said buoyancy forces operative to support the vessel during the operation; and displacing the thus upended vessels into storage locations in said storage space while maintaining buoyancy forces operative to give support to said vessels during such displacement, and retaining the upended vessels in such storage locations for transportation by the ship.

4,488,504

RELEASE AGENT MANAGEMENT SYSTEM FOR A HEAT AND PRESSURE FUSER APPARATUS

John E. Vineski, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 26, 1983, Ser. No. 461,089

Int. Cl.³ G03G *15/20*

U.S. Cl. 118—60 **10 Claims**

1. Release agent management apparatus for applying a predetermined quantity of silicone oil to the surface of a fuser roll, said apparatus comprising:

means for conveying a quantity of silicone oil from a sump to the surface of said fuser roll and depositing said silicone oil on a limited area only at the center of said fuser roll; and

means for effecting the spreading of said silicone oil over the working area of said fuser roll.

4,488,505

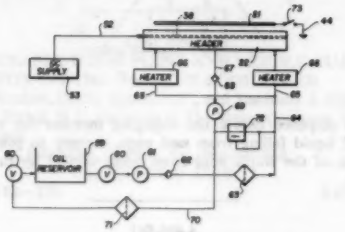
ELECTRONIC STRIP OILER

Edward J. Schaming, Butler, Pa., assignor to Schaming Industries, Inc., Butler, Pa.

Continuation-in-part of Ser. No. 283,643, Jul. 15, 1981, Pat. No. 4,391,219. This application May 13, 1983, Ser. No. 494,284

Int. Cl.³ B05B *5/02*

U.S. Cl. 118—630 **14 Claims**



1. An apparatus for coating a moving metal strip with oil or the like by electronic attraction comprising an oil delivery header at least on one side of the strip across the path of movement of the strip in spaced relationship thereto and having oil discharge outlet means, means for electrically grounding the moving metal strip, a perforated diffuser plate disposed within the header and dividing it longitudinally into two compartments which communicate only through the perforations of the diffuser plate, one of said compartments being in communication with said oil discharge outlet means, pumping means to deliver oil into the other compartment of the header, means to impress a high voltage low current electrical charge on the perforated diffuser plate to electrically charge a bath of oil substantially filling the compartments of the header within which the diffuser plate is submerged, and means to recover excess oil delivered from the oil discharge outlet means and return it to said pumping means for recycling in the apparatus.

4,488,506

METALLIZATION PLANT

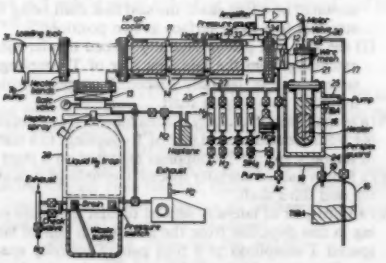
Rudolf A. H. Heinecke, Harlow; Ronald C. Stern, Cheshunt, and Michael J. Cooke, Harlow, all of England, assignors to ITT Industries, Inc., New York, N.Y.

Filed Jun. 15, 1982, Ser. No. 388,774

Claims priority, application United Kingdom, Jun. 18, 1981, 8118509

Int. Cl.³ C23C *13/08*

U.S. Cl. 118—667 **4 Claims**



1. An apparatus for depositing a metal or alloy film on solid substrates by thermal decomposition of one or more volatile metal compounds, comprising:

means for defining an enclosed deposition zone;

a vessel for receiving a quantity of the metal compound in

liquified form and form which the compound evaporates as a volatile compound;

means for supplying the volatile compound from the vessel to the deposition zone; and

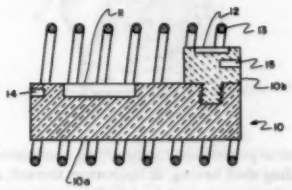
means for maintaining the vessel at a steady temperature at which said compound is substantially stable and for supplying heat to the liquid compound therein at a rate sufficient for replacing the latent heat of evaporation and controlling the rate at which the liquid is evaporated and further comprising a cold trap for condensing spent reactant gases, and means for spraying the cold trap with an inert liquid which freezes on the cold trap to form a barrier layer thereon.

4,488,507

SUSCEPTORS FOR ORGANOMETALLIC VAPOR-PHASE EPITAXIAL (OMVPE) METHOD

David A. Jackson, Jr., 7917 Carrleigh Pkwy., Springfield, Va. 22152

Filed Sep. 30, 1982, Ser. No. 429,656
Int. Cl.³ C23C 13/12
U.S. Cl. 118—726 7 Claims



1. A susceptor for use in a vapor-growth reactor wherein two different temperature regions are required, and wherein said susceptor is a body constructed at least partially of a radio-frequency energy-absorbing material heated by an adjacent radio-frequency coil, whereby said body includes:

a first volume of a first predetermined radio-frequency absorptivity and with a reservoir formed therein for holding a material to be vaporized; and

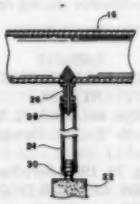
a second volume of a second predetermined radio-frequency absorptivity higher than said first predetermined radio-frequency absorptivity and with a cavity formed therein for holding a substrate.

4,488,508

AERATION/CIRCULATION METHOD AND APPARATUS UTILIZING LOW PRESSURE AIR

Robert C. Heideman, P.O. Box 1446, Apopka, Fla. 32704

Filed Jun. 10, 1983, Ser. No. 503,011
Int. Cl.³ A01K 61/00; C02F 3/02
U.S. Cl. 119—3 7 Claims



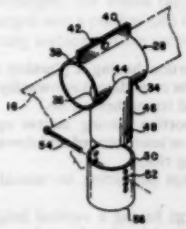
1. A low pressure valveless floating aeration system for providing oxygen and circulation to a water impoundment of substantial size in which aquaculture may be pursued, comprising an air blower, at least one essentially continuous elongate floating member at least fifty feet long, and having a hollow interior, which elongate member floats on the water surface when air from said blower is supplied thereto, a plurality of porous air diffusers suspended in a spaced relationship by hollow connectors from said floating member, said air diffusers disposed relatively near to said air blower being suspended deeper than those remote from said blower, a hollow insert at the upper end of each of said hollow connectors functioning to supply air from said floating member to said diffusers, said inserts being readily connected to said floating member at desired intervals without any severing of said floating member, and with negligible increase in the impedance to air flow through said floating member, such that low pressure air supplied by said blower is caused to issue as tiny bubbles from said diffusers from selected locations below the surface of the body of water.

4,488,509

FEEDER SYSTEM EMPLOYING AN ADJUSTABLE DISPENSER OUTLET

Patrick M. Awalt, P.O. Box 221, Waco, Ga. 30182

Filed May 5, 1983, Ser. No. 492,008
Int. Cl.³ A01K 39/012
U.S. Cl. 119—53 15 Claims



1. In a dispensing arrangement for small birds, such as 1 day to approximately 14 day old baby chickens, to be applied to a feed conduit, including a system having existing feed stations thereon, in which feed is continuously supplied:

means on said conduit at spaced, selected open locations thereon providing an open feed outlet which dispenses feed downwardly by gravity and said outlet comprising a feed outlet opening in the bottom through which the feed is dispensed and into which feed will back up temporarily to close the respective opening, said means comprising attachment means attaching said outlet to said open location on said conduit, and

separate and detached container means supported on the ground beneath each of said outlets for containing feed therein which falls from said outlet piling to a height and into said feed outlet and opening ultimately at times to stop the feeding thereof, said container having unobstructed low sides above the ground so that the small birds can get in the container and said container being effectively open and unobstructed beneath said feed conduit whereby the small birds cannot be trapped.

4,488,510

HAY FEEDER

George L. Lundgren, Sr., Rte. 2, Box 234A, Kearney, Nebr. 68847

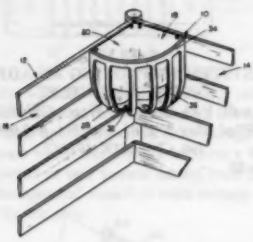
Filed Sep. 23, 1983, Ser. No. 535,267
Int. Cl.³ A01K 1/10
U.S. Cl. 119—60 2 Claims

1. A hay feeder comprising,

a vertically disposed first back wall portion adapted to be secured to a vertically disposed first wall,

a vertically disposed second back wall portion extending at

a right angle to said first back wall portion and adapted to be secured to a vertically disposed second wall,
and an arcuate front wall portion extending between said back wall portions to define a hay storage compartment having an open upper end,
each of said back wall portions having arcuate outer edges, each of said outer edges extending downwardly and inwardly from its upper end,
said arcuate front wall portion extending downwardly and inwardly in an arcuate fashion from its upper end towards its lower end,
said front wall portion having a horizontally disposed strengthening rib at its upper end,



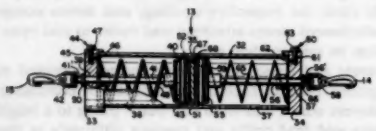
said front wall portion having a plurality of spaced-apart strengthening ribs extending downwardly from said horizontally disposed strengthening rib,
said front wall portion having access openings formed therein between at least some of said downwardly extending strengthening ribs,
said access openings permitting an animal to feed therethrough,
said access openings having a vertical height substantially less than the vertical height of said front wall portion,
said back wall portions and said front wall portion being comprised of a thermoplastic material.

4,488,511

SHOCK-ABSORBENT LEASH FOR ANIMALS

Vincent R. Grassano, 41 Ridge Rd., Media, Pa. 19063

Filed Mar. 7, 1983, Ser. No. 473,045
Int. Cl.³ A01K *27/00*
U.S. Cl. 119—109 **13 Claims**



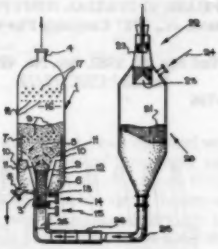
1. In an animal leash having a manual grip at one end and a fastening means at its opposite end for attachment to an animal, a device for absorbing shock resulting from pull of the animal on the leash comprising
(a) a hollow cylinder including a piston disposed slidably therein,
(b) a cylinder end cap,
(c) a piston rod connected to the piston and extending through the end cap outwardly of the cylinder,
(d) connection means for connecting the leash to the cylinder externally of the cylinder, whereby force from the pull of the animal is transmitted to the piston to cause the piston to advance in the cylinder,
(e) air conduit means in the end cap for connecting the interior of the cylinder to the ambient atmosphere and
(f) and adjustable valve located in the air conduit means, said valve being operative to regulate the rate of flow of air from the cylinder to control selectively compression of air within the cylinder upon advancement of the piston,
(g) said compressed air in the cylinder functioning as resilient means yieldingly resisting the advance of the piston.

4,488,512

FEEDSTOCK INJECTION SYSTEM FOR FLUIDIZED BED COMBUSTOR

Bede A. Boyle, Commonwealth Bank House, 140 Hunter St., Newcastle, N.S.W., 2300, Australia

Filed Oct. 27, 1983, Ser. No. 545,911
Claims priority, application Australia, Nov. 4, 1982, PF6648
Int. Cl.³ F22B *1/00*
U.S. Cl. 122—4 D **6 Claims**



1. A hydro/pressurized fluidized bed combustor comprising an upstanding shell having, at the bottom thereof, an entry port for low velocity entry of feedstock to said combustor, said feedstock including particulate solid material, steam and water; a pressurized hopper for said feedstock; a feedstock conduit communicating said entry port with said hopper, said feedstock conduit being surrounded, for at least a part of its length, by a heat exchanger; an upstanding, contoured entry conduit having a trumpet-shaped catenoid vertical cross-section gradually enlarging in an upward direction, said entry conduit being accommodated within the lower half of said upstanding shell and in communication with said entry port, said entry conduit being provided with a plurality of tuyeres in its peripheral wall; a jacket surrounding said entry conduit and in communication with a further jacket surrounding said entry port, said entry port jacket being provided with air and stream inlets; a fluidized bed in the upper portion of said entry conduit, for combustion of said feedstock; at least one in-bed cooling tube located in a combustion zone of said fluidized bed; at least one freeboard steam generation tube located above said combustion zone; and a weir located above said entry conduit and in communication therewith, said weir acting to extract ash from said fluidized bed at a rate which keeps the height of the bed constant within the combustor during operation thereof.

4,488,513

GAS COOLER FOR PRODUCTION OF SUPERHEATED STEAM

Frederick C. Jahnke, Rye, and James R. Muenger, Beacon, both of N.Y., assignors to Texaco Development Corp., White Plains, N.Y.

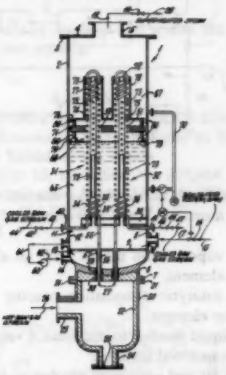
Filed Aug. 29, 1983, Ser. No. 527,458
Int. Cl.³ F22B *1/02*
U.S. Cl. 122—32 **5 Claims**

1. A gas cooler for cooling a hot raw gas stream and simultaneously producing a separate stream of superheated steam comprising:
(1) a closed vertical cylindrically shaped pressure vessel with an upper central outlet for the removal of superheated steam produced therein, an inlet near the lower end

of said vessel for introducing and partially filling said vessel with boiler feed water;

(2) a refractory lined hot gas inlet chamber with a gas inlet and a plurality of gas outlets, said gas inlet chamber being attached to the bottom end of said pressure vessel;

(3) a plurality of uniformly spaced vertical bundles of helical tubes extending lengthwise in a portion of said vessel with a portion only of each bundle of helical tubes being submerged in said boiler feed water and providing a free space above and around that portion of each bundle of helical tubes which extends above the water level for the passage of steam; baffle means located above said water level in order to confine the upward flow path of the saturated steam produced in said vessel so that it more directly contacts the external surfaces of the unsubmerged portions of said bundles of helical tubes; wherein said baffle means comprises a transverse disc with circular holes through which pass said plurality of vertical bundles



of helical tubes, and a vertical conduit having a central longitudinal axis that is parallel to that of the pressure vessel surrounds each of said bundles of helical tubes and is radially spaced therefrom with the lower ends of said conduits being perpendicularly attached to said transverse disc, and each of said vertical conduits is open at each end and extends upward from each hole to the upper portion or end of said bundles of helical tubes; wherein said baffle means with or without a demister means is fixed in place or is supported by a floating means that floats on the water level; and wherein near the lower ends of said bundles of helical tubes the helical tubes have gas outlet means for the discharge of cooled raw gas from the vessel and water cooled gas inlet means which extend through the lower end of the vessel and are in communication with said hot gas inlet chamber and;

(4) means for controlling the level of the boiler feed water in the vessel.

4,488,514

SOLID FUEL BOILER OF THE RADIATING FURNACE TUBE TYPE, METHOD FOR CONVERTING A BOILER AND MEANS FOR CARRYING OUT SAID METHOD

Marcel C. K. de Poray, "Villa Suez" Rue Fournier, 83110 Sanary-Sur-Mer, and Roland Kissel, 12 Rue Albert Ier, 78110 Le Vesinet, both of France

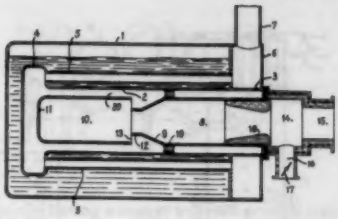
Filed May 12, 1983, Ser. No. 493,852

Claims priority, application France, May 17, 1982, 82 08603

Int. Cl.³ F22B *7/12*

U.S. Cl. 122—149 **8 Claims**

1. A solid fuel boiler, comprising: a primary furnace for initiating combustion reactions, a secondary furnace defined by extended radiating tube means in which the combustion reactions are completed, means defining a liquid containing heating surface (2) disposed around and defining an annular space with the radiating tube means, the radiating tube means implementing secondary combustion and comprising two coaxial chambers, a first one of said chambers (8) having an open convergent terminus (9) for directing combustion gases toward a second one of said chambers (10), said second chamber having



a closed remote end (11) and an entrance having a diameter larger than the diameter of an adjacent end portion of said convergent terminus to define therewith an annular opening through which combustion gases injected into the second chamber are discharged, and means (19) for redirecting the gases thus discharged into a portion (20) of said annular space between the heating surface and the second chamber.

4,488,515

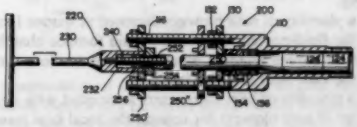
HYDRAULIC COLUMN CHOKE AND REAMER

David H. Swallow, P.O. Box 1381, Havre, Mont. 59501

Filed Jul. 5, 1983, Ser. No. 510,815

Int. Cl.³ F22B *37/18*; F28G *1/00*

U.S. Cl. 122—379 **2 Claims**



1. A hydraulic column choke and reamer for hydraulic vessels comprising:

A. A tubular valve body engagable with a column of an hydraulic vessel and including means for compression mounting thereof to the column, said valve body defining a valve-controlled air vent therein;

B. A reaming assembly, reciprocably mounted in sealed relation to the valve body, said reaming assembly including a reamer wrench and reamer, the reamer defining a declining inner end with at least one coaxial channel therein to exhaust scale therefrom and a compressive packing gland in the assembly whereby to seal the assembly relative to the valve body;

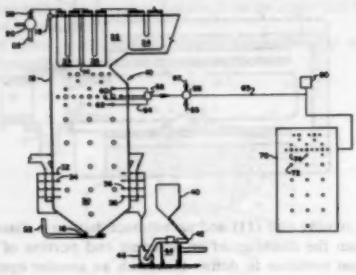
C. A compression rod and sleeve therefor, a working end of the compression rod and sleeve securing the reamer and a flexible column choke therebetween;

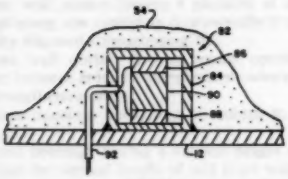
D. A compression packing plate disposed externally adjacent to the flexible column choke to preclude blowout of the choke.

4,488,516
SOOT BLOWER SYSTEM

Kees A. Baeters, Enfield, Conn., and Mark S. Andersen, Port Huron, Mich., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Nov. 18, 1983, Ser. No. 553,015
Int. Cl.³ F22B 37/18
U.S. Cl. 122—379 2 Claims





1. A soot blower system for selectively cleaning ash deposits from the walls of a furnace chamber wherein the walls are formed of a series of laterally adjacent fluid-cooled tubes and wherein an ash-bearing fuel is combusted to generate hot combustion products which transfer heat to the fluid-cooled tube walls of said furnace chamber; said soot blower system comprising:

a. a plurality of soot blowers disposed at spaced locations in the fluid-cooled tube walls of said furnace chamber, each soot blower adapted when activated to clean a region of the tube wall surrounding it;

b. a plurality of heat flux meters associated with said plurality of soot blowers for sensing the local heat transfer rate from the hot combustion products to the tube walls, at least one heat flux meter located in each cleaning region associated with each of said plurality of soot blowers;

c. display means for indicating the relative position thereon of each of said plurality of soot blowers and each of said plurality of heat flux meters; said display means having first indication means for indicating the operational status of each of said soot blowers and second indication means for indicating the output of each of said heat flux meters;

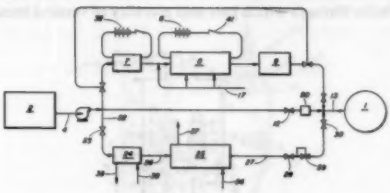
d. first comparison means for comparing the local heat transfer rate sensed by each of said plurality of heat flux meters to a preselected lower value set point of heat transfer rate and generating an output for activating the second indication means associated with each heat flux meter for which the sensed local heat transfer rate is less than the preselected lower value set point; and

e. second comparison means for comparing the local heat transfer rate sensed by each of said plurality of heat flux meters to a preselected upper value set point of heat transfer rate and generating an output for deactivating the second indication means associated with each heat flux meter for which the sensed local heat transfer rate is greater than the preselected upper value set point.

4,488,517
COLD START METHOD WITH START-UP GASEOUS FUEL GENERATION SYSTEM FOR METHANOL FUELED CARS

Heeyoung Yoon, McMurray, Pa., assignor to Conoco Inc., Wilmington, Del.

Filed Apr. 15, 1983, Ser. No. 485,149
Int. Cl.³ F02B 43/08; F02M 13/06
U.S. Cl. 123—3 1 Claim



1. A method of cold starting an internal combustion engine operated on atomized liquid fuel after start up comprising the steps of:

heating a vaporization means with an electrical resistance heating element,

heating a catalytic dissociation reactor with an electrical resistance element,

pumping liquid alcohol to said heated vaporization means to form a vaporized alcohol,

conveying air and vaporized alcohol to said catalytic dissociation reactor wherein partial combustion of said vaporized alcohol occurs as well as dissociation of said vaporized alcohol to form a partial start up fuel mixture comprising hydrogen and carbon monoxide,

pumping liquid alcohol to an atomization means to form atomized liquid alcohol,

adding said partial start up fuel mixture and said atomized liquid alcohol to form a complete start up fuel mixture,

conveying said complete start up fuel mixture to said internal combustion engine,

starting said internal combustion engine by igniting a mixture of air and complete start up fuel mixture therewithin.

4,488,518
ENGINE COOLING DEVICE

Peter Wohlfarth, Ludwigsburg, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Feb. 9, 1983, Ser. No. 465,253
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1982, 3204790
Int. Cl.³ F01B 5/06
U.S. Cl. 123—41.49 8 Claims

1. A cooling device, especially for a liquid-cooled internal-combustion engine of an armoured vehicle or the like comprising:

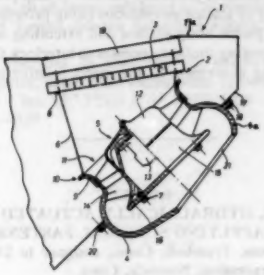
an annular-gap grating arranged at a vehicle wall,

a fan for conveying air outwardly of the vehicle through the grating,

air guide body means for guiding the flow of air, and

air guide support blade means for supporting the air guide

body means, wherein said fan, said air guide body means, and said air guide support blade means are supported by



and disposed radially inside of and within the axial extent of the annular-gap grating.

4,488,519

INTAKE SYSTEM FOR FOUR-CYCLE ENGINES

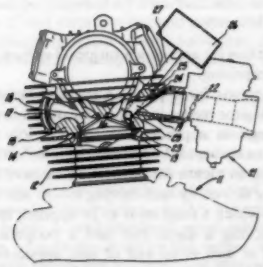
Hajime Kishida, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaishi, Iwata, Japan

Filed May 13, 1982, Ser. No. 377,965

Claims priority, application Japan, May 15, 1981, 56-73278

Int. Cl.³ F02B *29/00, 31/00*

U.S. Cl. 123—52 M **7 Claims**



1. In an internal combustion engine having a chamber, an intake passage for delivering a charge to said chamber, and check valve means in said intake passage upstream of said chamber for precluding reverse flow from said chamber through said intake passage, the improvement comprising means for promoting continued flow through said intake passage and retarding closure of said check valve means including a plenum chamber communicating with said intake passage downstream of said check valve means.

4,488,520

VALVE ROCKER ASSEMBLY

Emil Almor, Ilford, England, assignor to Ford Motor Company, Dearborn, Mich.

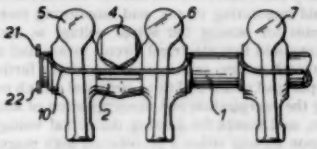
Filed Jul. 28, 1983, Ser. No. 518,226

Claims priority, application United Kingdom, Aug. 18, 1982, 8223743

Int. Cl.³ F01L *1/46*

U.S. Cl. 123—90.39 **1 Claim**

1. A valve rocker assembly for an internal combustion engine comprising a rocker shaft, pedestals for mounting the rocker shaft on an engine cylinder head, rocker arms pivotally mounted on the rocker shaft such that a pair of rocker arms straddles each pedestal with each one of the pair of rocker arms contiguous thereto, and an axially extending one piece wire spring metal clip holding member resiliently removably mounted on the rocker shaft, the clip having a loop at each end resiliently circumferentially surrounding and engaging the rocker shaft, the loop being of a diameter slightly smaller than the diameter of the shaft to deform under an interference fit with the shaft upon assembly thereto for retaining the clip to



the shaft, the clip having a central indented portion operably engageable in a mating groove in the pedestal for nonrotatably locating the clip relative to the rocker shaft, each clip acting on the contiguous rocker arms to position the rocker arms axially on the rocker shaft relative to the pedestal, each clip exerting a load in an axial direction on a respective rocker arm locating them axially against the pedestal.

4,488,521

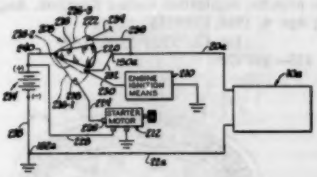
MONITORING MEANS FOR COMBUSTION ENGINE ELECTRIC STORAGE BATTERY MEANS

Gerald K. Miller, Hersey; Robert E. Taylor, Cadillac, and Norman A. Rautiola, Reed City, all of Mich., assignors to Nartron Corporation, Reed City, Mich., a part interest

Division of Ser. No. 939,495, Sep. 5, 1978, Pat. No. 4,306,270. This application Dec. 12, 1980, Ser. No. 215,636

Int. Cl.³ F02N *11/10*

U.S. Cl. 123—179 BG **10 Claims**



1. The combination of a combustion engine, electric storage battery means, electrically powered starter motor means for at times driving said engine in order to start said engine, engine ignition means, operator positionable first electrical switch means, second electrical switch means closable upon electrical energization thereof, first electrical circuit means electrically interconnecting said battery means and said first electrical switch means, second electrical circuit means interconnecting said battery means and said starter motor means, said second electrical switch means when closed being effective to electrically close said second electrical circuit means through said starter motor means in order to thereby electrically power said starting motor means for driving said engine, first electrical contact means, third electrical circuit means electrically interconnecting said second switch means with said first electrical contact means, second electrical contact means, fourth electrical circuit means interconnecting said engine ignition means with said second electrical contact means, third electrical contact means, electrical system monitoring means, fifth electrical circuit means electrically interconnecting a first portion of said monitoring means to said third electrical contact means, and sixth electrical circuit means electrically interconnecting a second portion of said monitoring means to said battery means, said first electrical switch means when positioned as to be in

electrical contact with said first electrical contact means being effective to electrically energize said second electrical switch means, said first electrical switch means being effective when positioned as to be in electrical contact with said second electrical contact means to electrically close said fourth electrical circuit means through said engine ignition means, said first electrical switch means being effective when positioned as to be in electrical contact with said third electrical contact means to electrically close said fifth and sixth electrical circuit means through said monitoring means, said monitoring means comprising means for sensing the actual voltage as across said battery means said first electrical circuit means and said first electrical switch means, said monitoring means further comprising output load means and third electrical switch means for controlling the energization and deenergization of said output load means, said means for sensing the actual voltage being effective upon sensing either a preselected high magnitude of said actual voltage or a preselected low magnitude of said actual voltage for actuating said third electrical switch means, said means for sensing the actual voltage comprising voltage divider means and NAND gate means, said NAND gate means comprising first second third and fourth gate means, said first gate means being effective upon the occurrence of said relatively high magnitude of actual voltage for producing and applying a first low signal to said second gate means for in turn causing said second gate means to produce and apply a high signal to said third gate means, said third gate means upon application thereto of said high signal being effective for producing and applying a low signal to said fourth gate means thereby causing said fourth gate means to produce a high output signal and apply such output signal to said third electrical switch means for actuation thereof.

4,488,522

PISTONS INCLUDING INSERTS

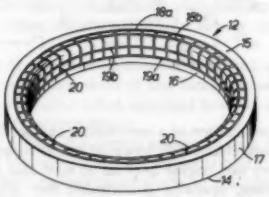
Kenneth J. Jones, Tamworth, England, assignor to AE PLC, Rugby, England

Filed Aug. 24, 1982, Ser. No. 410,918

Claims priority, application United Kingdom, Aug. 28, 1981, 8126272; Apr. 6, 1982, 8210176

Int. Cl.³ F02F *3/00, 5/00*

U.S. Cl. 123—193 CP **7 Claims**



1. A piston for an internal combustion engine comprising:
a crown formed at one end of the piston,
a cast body of a light metal material,
an insert of a material more resistant than the material of the light metal body, and incorporated into the piston during casting of the light metal body,
a piston feature formed in the insert,
a crown surface included on the insert and forming at least a portion of said crown of the piston,
at least one further surface to said insert, said at least one further surface extending generally parallel to an axis of the piston which is normal to said crown,
at least one piston body surface co-operating with said at least one further surface of the insert,
a plurality of shallow recesses extending circumferentially around said at least one further surface of the insert,
a plurality of projections formed on said at least one piston body surface by the material of the piston body and extending into the shallow recesses to interlock therewith, said at least one further surface of said insert also includes a plurality of rotation-preventing shallow recesses extending in a direction generally parallel to said piston axis and a plurality of spaced projections being provided on said at least one piston body surface and extending into the rotation-preventing shallow recesses to interlock therewith, so preventing movement of the insert relative to the piston body.

4,488,523

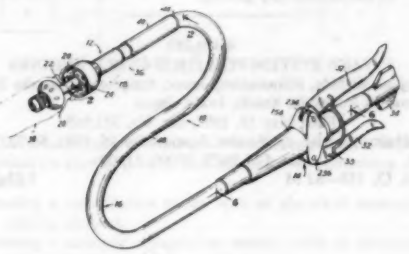
FLEXIBLE, HYDRAULICALLY ACTUATED DEVICE FOR APPLYING SURGICAL FASTENERS

Daniel Shichman, Trumbull, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Sep. 24, 1982, Ser. No. 423,467

Int. Cl.³ A61B *17/04*

U.S. Cl. 128—334 R **13 Claims**



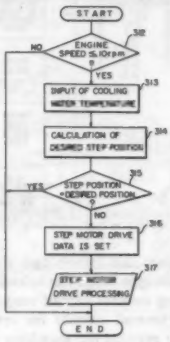
1. An apparatus for applying a surgical fastener to tissue, said apparatus comprising:
applicator means for applying a surgical fastener to tissue, said applicator means including means for driving a surgical fastener in a predetermined direction to apply the fastener to tissue; said applicator means further including anvil support means for supporting an anvil for clinching a fastener driven by said driving means and for clamping tissue to which a fastener is to be applied; said applicator means having a distal end and a cooperating element disposed at said distal end of said applicator means for clamping tissue between the anvil and said cooperating element;
actuator means for actuating said applicator means to drive a fastener in said predetermined direction;
shaft means joining said actuator means and said applicator means, and comprising a first hydraulic line containing hydraulic fluid for hydraulically transmitting an actuation force from said actuator means to said applicator means to cause said applicator means to drive a fastener in said predetermined direction; said shaft means being sufficiently flexible to bend, in a direction transverse to its length, during insertion into a body channel, to conform to the configuration of said body channel into which the apparatus is inserted for the particular surgical operation, and sufficiently stiff to retain such configuration during application of a fastener; and
means for moving an anvil supported by said anvil support means and for adjusting the distance between the anvil and said cooperating element preparatory to applying a fastener;
said anvil moving means comprising a control mechanism disposed in said actuator means, and means disposed in said shaft means for transmitting a force hydraulically from said control mechanism to said anvil support means for moving said anvil support means.

4,488,524

IDLING SPEED CONTROL FOR ENGINES

Kengo Sugiura, Anjo; Yasutaka Yamauchi, Toyota, and Hiroshi Ito, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Jul. 28, 1982, Ser. No. 402,807
Claims priority, application Japan, Aug. 1, 1981, 56-120808
Int. Cl.³ F02D *1/04;* F02B *3/00*
U.S. Cl. 123—339 **8 Claims**



1. An idle speed controlling device for an internal combustion engine comprising:

a main intake passage;

a throttle valve arranged in said main intake passage;

a bypass passage branched off from said main intake passage upstream of said throttle valve and connected to said main intake passage upstream of said valve and connected to said main intake passage downstream of said throttle valve;

a control valve arranged in said bypass passage;

a step motor connected to said control valve and having a plurality of step positions which are changed in accordance with the rotating motion of said step motor;

speed sensor means for detecting an engine speed to produce an output signal indicating the engine speed; and

control means for determining whether the engine speed is reduced below a predetermined speed which causes the engine to stop on the basis of the output signal of said speed sensor means and actuating said step motor until the step position of step motor reaches a maximum extent when the engine speed is lower than said predetermined speed, and said step motor being actuated to position said control valve to a given position when the engine speed is greater than or equal to said predetermined speed.

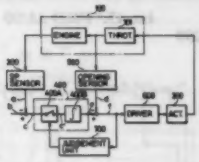
4,488,525

ENGINE SPEED CONTROL DEVICE FOR INTERNAL COMBUSTION ENGINE

Kazumichi Tsutsumi, Hyogo, and Tadakazu Ueda, Hiroshima, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha and Mazda Motor Corporation, both of, Japan

Filed Sep. 24, 1982, Ser. No. 423,333
Claims priority, application Japan, Sep. 25, 1981, 56-152783
Int. Cl.³ F02D *31/00*
U.S. Cl. 123—352 **6 Claims**

1. An engine speed control device, comprising; an acutator for controlling a control valve of said engine, an opening sensor for detecting a degree of opening of said control valve, an arithmetic unit for producing an output value determined according to the deviation between an actual engine speed of said engine and a predetermined desired engine speed, means for controlling said control valve through said actuator according to the deviation between said output value of the arithmetic unit representing a desired opening degree of said control valve and an actual opening degree detected by said opening sensor, and decision means for suspending the operation of said arithmetic unit to hold said output value when said



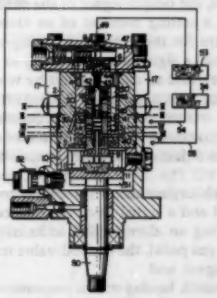
deviation of said opening degree is continuously maintained equal to or above a predetermined value for a predetermined period of time.

4,488,526

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINE

Ikuo Takahashi, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 24, 1982, Ser. No. 423,445
Claims priority, application Japan, Sep. 28, 1981, 56/152185
Int. Cl.³ F02M *59/42*
U.S. Cl. 123—357 **3 Claims**



1. A fuel injection pump for an internal combustion engine comprising:

a rotor located in a housing;

a free piston movably mounted in an axial bore in said rotor;

two pressure chambers defined by an inner wall surface of said axial bore in said rotor and said free piston;

two solenoid valves for supplying fuel to said two pressure chambers; and

means for sensing an axial displacement of said free piston including:

a displacement sensing coil having its inductance varied as said free piston is displaced axially;

a holding rod for securing said displacement sensing coil thereto;

a thrust ring rotatably fitted between the inner wall surface of said axial bore in said rotor and an outer periphery of said holding rod; and

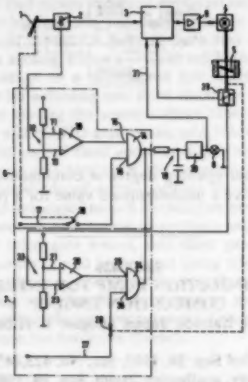
a member secured to said rotor for keeping said thrust ring from moving axially.

4,488,527

DEVICE FOR CONTROLLING THE SPEED OF TRAVEL OF AN AUTOMOTIVE VEHICLE

Manfred Pfalzgraf, Frankfurt am Main, and Kurt Probst, Schwalbach, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 12, 1983, Ser. No. 531,125
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1982, 3237535
Int. Cl.³ F02D 33/00
U.S. Cl. 123—399 20 Claims



1. In a device for controlling the speed of travel of an automotive vehicle, having a desired-value transmitter adjustable by a gas pedal, the output signal of the desired-value transmitter acting on a setting member of an element controlling an fuel-air mixture for the vehicle, a setting-member transmitter which produces a signal corresponding to the position of the setting member, and an alarm circuit by which an alarm signal is feedable to an alarm device when with an unactuated desired-value transmitter the setting member is in a gas position, the improvement wherein said alarm circuit provides an indication of a defect in the alarm function, said alarm circuit comprising:

a first branch having means responsive to the position of the gas pedal and a signal from the desired-value transmitter for emitting an alarm signal at its output when with an actuated gas pedal, the desired-value transmitter produces an idle signal, and

a second branch having means responsive to the position of the setting member and a signal from the setting member for emitting an alarm signal at its output when, with the setting member being actuated, said setting-member transmitter produces an idle signal.

4,488,528

SYSTEM FOR CONTROLLING THE IGNITION TIMING OF A COMBUSTION ENGINE

Kouji Morikawa, Naritahigashi, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

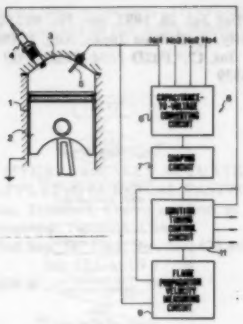
Filed Mar. 8, 1984, Ser. No. 587,739
Claims priority, application Japan, Mar. 12, 1983, 58-41123
Int. Cl.³ F02P 5/04
U.S. Cl. 123—425 4 Claims

1. A system for controlling the ignition timing of a combustion engine comprising:

a probe provided on the wall of a cylinder of the engine opposite the piston in the cylinder;

a first circuit for measuring the crank angle of the engine by the capacitance between said probe and the top of the piston and for producing an output dependent on the crank angle;

a second circuit for measuring the velocity of flame propagation in the cylinder by detecting the ionization current



flowing between said probe and the cylinder and for producing an output when the velocity is very high;

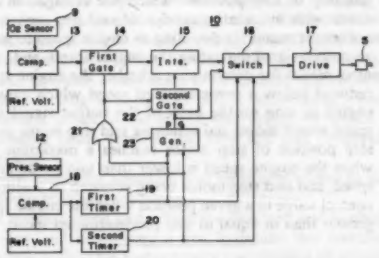
an ignition timing control circuit responsive to outputs of said first and second circuits for retarding the ignition timing so as to prevent the knocking of the engine.

4,488,529

AUTOMOBILE AIR/FUEL CONTROL SYSTEM

Toshiaki Nishida; Kazuyuki Okazaki; Hideki Kakumoto, and Tatsuji Ikeda, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Shinchi, Japan

Filed Nov. 22, 1983, Ser. No. 554,450
Claims priority, application Japan, Nov. 24, 1982, 57-206583
Int. Cl.³ F02M 7/00
U.S. Cl. 123—438 8 Claims



1. An air-fuel ratio control system for an internal combustion engine having an intake passage, and an exhaust passage extending between the engine and the atmosphere for the discharge of exhaust gases emitted from the engine as a result of combustion of a combustible mixture, which system comprises, in combination:

a mixture supply device for supplying the combustible mixture towards the engine;

an air-fuel ratio adjusting device for adjusting the air-fuel mixing ratio of the combustible mixture;

means for detecting the occurrence of a high load engine operating condition and providing a detector output indicative thereof; and

a control means operable in response to the detector signal to apply an enriching signal to the adjusting device, to control said adjusting device to lower the air-fuel mixing ratio during the high load engine operating condition to a value lower than that during a medium load engine oper-

ating condition, and also to interrupt the generation of the enriching signal for a predetermined time subsequent to the generation of the enriching signal incident to the transit to the high load engine operating condition.

4,488,530

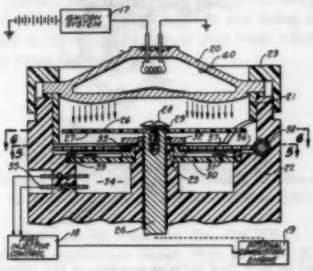
CONTROLLING AND SWITCHING MECHANISM

Isadore Turetsky, 23940 Welby Way, Canoga Park, Calif. 91307

Continuation-in-part of Ser. No. 455,817, Feb. 22, 1983, abandoned. This application Apr. 26, 1984, Ser. No. 604,177

Int. Cl.³ F02B *29/00*

U.S. Cl. 123—477 **11 Claims**



1. In a fuel injection system for an internal combustion engine, a controlling and switching mechanism using radiant energy for controlling the sequential operation of the fuel injectors, said mechanism comprising:

A source of radiant energy

A first element having a plurality of switching members which are sensitive to said radiant energy, said members fixed to said element and electrically connected in the circuit controlling their associated fuel injectors

A revolving beam of said radiant energy directed toward said element, said beam revolving in timed relationship with the engine shaft

A second element disposed between the revolving beam of radiant energy and said switching members, said element having a plurality of apertures therein through which said beam is directed; there being an aperture for each switching member; said second element adapted for optional rotation so as to partially expose each switching member to said beam by means of its associated aperture; the length of an energizing pulse when said switching meember is activated by the radiant energy, in degrees of engine shaft rotation, being a function of that part of the switching member exposed to said beam radiant energy

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4,488,531

PLURAL INTAKE SYSTEM FOR SUPERCHARGED ENGINE

Tomoo Tadokoro; Haruo Okimoto; Masami Nakao, all of Hiroshima, and Masato Iwaki, Higashi Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 31, 1982, Ser. No. 363,772

Claims priority, application Japan, Apr. 6, 1981, 56-52252; Jul. 13, 1981, 56-109656

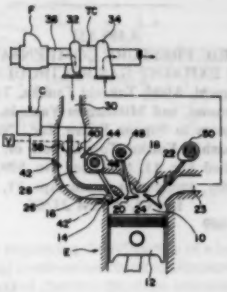
Int. Cl.³ F02B *25/00*

U.S. Cl. 123—559 **5 Claims**

1. A fuel intake system for a supercharged automotive engine having a cylinder means with first and second fuel intake ports and an exhaust port, which comprises, in combination:

a supercharger for drawing in and supercharging air from outside the system;

a fuel intake passage system extending between the supercharger and the cylinder means of the engine and including first and second passage means, said first passage means being communicated at one end with the supercharger and at the other end with the first fuel intake port of the cylinder means and having therein a first throttle valve operable during at least a low load engine operating condition for regulating the flow of air therethrough, said second passage means being communicated at one end with the supercharger and at the other end with the second fuel intake port and having therein a second throttle valve operable during a high load engine operating condition for regulating the flow of air therethrough, means for



opening said second fuel intake port at a time preceding the closure of the exhaust port and for opening said first fuel intake port after the opening of the second fuel intake port; and

a fuel supply means for supplying fuel into the fuel intake passage system for creating in admixture with the air flowing therethrough a combustible air-fuel mixture and supplying said mixture to said passage means for flow in the cylinder means.

4,488,532

GAS-DYNAMIC PRESSURE WAVE MACHINE WITH EXHAUST GAS BYPASS

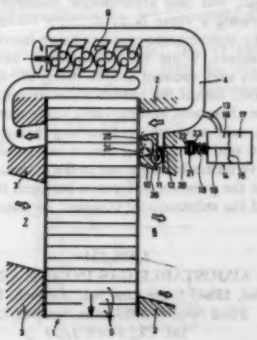
Andreas Mayer, Niederrohrdorf, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Sep. 29, 1982, Ser. No. 427,728

Claims priority, application Switzerland, Nov. 30, 1981, 7641/81

Int. Cl.³ F02B *33/42*

U.S. Cl. 123—559 **2 Claims**



1. A gas-dynamic pressure wave machine for the supercharging of an internal combustion engine comprising:

a rotor with axially straight cells open on both sides thereof;

a gas casing having a high-pressure gas supply duct and a low pressure gas escape duct formed therein;

exhaust gas bypass means located within said casing connecting the high-pressure gas supply duct with the low pressure gas escape duct and including medium-control flap means; and

a gas pocket formed in said gas casing and which is open towards the rotor and located between the high pressure supply duct and the low pressure gas escape duct wherein said exhaust gas bypass means is connected with the gas pocket downstream of said flap means.

4,488,533

ATMOSPHERIC PRESSURE COMPENSATION SYSTEM FOR EXHAUST GAS RECIRCULATION

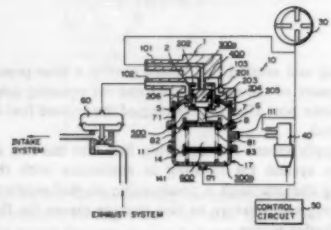
Kiyonori Sekiguchi, Aichi; Takeshi Tanaka, Toyohashi; Michio Kawagoe, Susono, and Mitsumasa Yamada, Mishima, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Apr. 11, 1984, Ser. No. 599,276

Claims priority, application Japan, Apr. 11, 1983, 58-63416

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—569 **6 Claims**



1. An atmospheric pressure compensation system for an exhaust gas recirculation of an internal combustion engine, comprising a vacuum source for generating vacuum pressure of substantially constant absolute value; an EGR valve for regulating the gas flow passing through an EGR passage by means of the vacuum pressure from said vacuum source; an atmospheric pressure compensation valve for opening and closing a passage for transmitting the vacuum pressure from said vacuum source to said EGR valve; a control circuit for detecting the engine running conditions and generating a control signal; an actuator means for contributing to actuate said atmospheric pressure compensation valve in response to said control signal; and said atmospheric pressure compensation valve comprising a valve body defining therein at least two chambers, the atmospheric pressure being introduced into one of said chambers, while the substantially constant vacuum pressure from said vacuum source being introduced into the other chamber, means for movably partitioning between said two pressure chambers, and movable valve means for opening and closing said vacuum transmitting passage, operatively connected to said partitioning means and to said actuator, so that said valve means be subjected to the actuating force of said actuator and the pressure difference between the atmospheric pressure and the substantially constant vacuum pressure.

4,488,534

DUAL ADJUSTABLE GAS INTAKE ASSEMBLY

Walter Koziol, 18845 State Line Rd., Antioch, Ill. 60002

Filed Nov. 4, 1983, Ser. No. 548,724

Int. Cl.³ F24B *3/00*

U.S. Cl. 126—25 R **20 Claims**

1. A dual adjustable gas intake tube assembly for a gas burner element comprising:

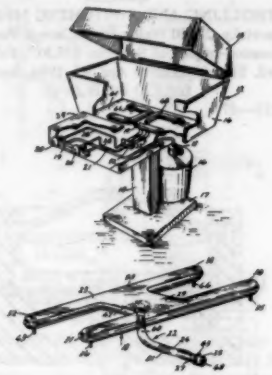
a first tubular portion defining at least one lateral aperture;

an air regulator member slidably received by said tubular portion at one end thereof to controllably cover said lateral aperture;

an opening defined by said tubular portion at one end for receiving a gas supply means;

a second tubular portion having a flexible section and connected to said first tubular portion at the other end, said flexible section constructed and arranged to provide both horizontal and vertical adjustment of said second tubular portion; and

means operatively associated with said second tubular portion for connection with a gas burner element.



4,488,535

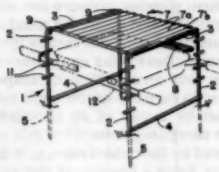
PORTABLE COOKING GRILL

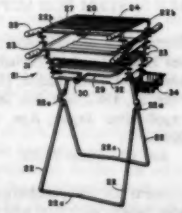
Richard J. Johnson, P.O. Box 1048, Westmont, Ill. 60559

Filed Apr. 25, 1983, Ser. No. 488,147

Int. Cl.³ A47J *37/00*

U.S. Cl. 126—25 A **20 Claims**





1. A portable cooking device comprising:

a knockdown supporting frame having four leg members extending upwardly from the ground to provide the four corner positions of a rectangel, as viewed on a horizontal plane passing through the frame, and

two parallel crosspieces, each of which connects upper

corner positions between any of two opposing leg members, respectively;

a plurality of studs mounted at intervals along each of said leg members to protect a short distance from said corner positions at preselected levels above the ground;

at least one removable cooking pan constructed and arranged to be held in a substantially horizontal position by said crosspieces or in a horizontal to inclined position by a set of said studs in pairs located at the same or different preselected levels above the ground; and

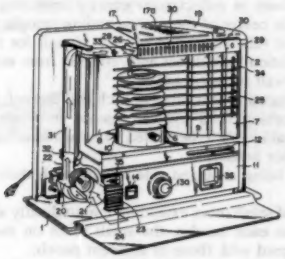
adjusting means including a plurality of bars attached to said pan for flexible movement substantially laterally thereof, said bars extending longitudinally beyond each of the four corner position, respectively, for support on said projecting studs when in a closed position and being movable upwardly or downwardly free of said studs when flexed laterally to an open position.

4,488,536

WARM AIR BLOWING HEATER

Nobuyuki Kojima, and Youichi Sekigawa, both of Kamo, Japan, assignors to Toshiba Heating Appliances Co., Ltd., Kamo, Japan

Filed Oct. 26, 1982, Ser. No. 436,795
Claims priority, application Japan, Mar. 10, 1982, 57-37791
Int. Cl.³ F24C *5/04*
U.S. Cl. 126—96 **7 Claims**



1. A warm air blowing heater comprising:

combustion equipment for burning fuel to produce hot air;

a body of box shape for housing said combustion equipment, said body including a front surface having a front opening and an upper surface having a portion directly above said combustion equipment;

a reflecting member provided behind said combustion equipment for reflecting combustion heat from said combustion equipment forwards;

blowing means provided adjacent to the upper surface of said body away from the portion of said upper surface directly above said combustion equipment, said blowing means comprising an air duct which has an air blowing opening, said air duct extending laterally to said combustion equipment along the front surface of said body and being fixedly suspended at the upper surface of said body but substantially spaced therefrom to form a vent space therewith, said blowing means being adapted for blowing relatively cool air from elsewhere in said body so as to draw the hot air from the upper portion of said body toward the front surface of the heater through said vent space and to mix the relatively cool air from elsewhere in said body with the hot air from the upper portion of said body; and

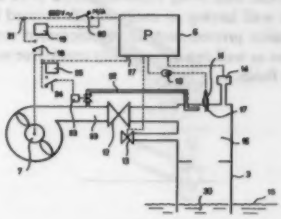
air supply means connected to said blowing means for supplying the relatively cool air thereto.

4,488,537

METHOD AND INSTALLATION FOR IMPROVING THE EFFICIENCY OF A SUBMERGED-COMBUSTION HEATING INSTALLATION

Francois Laurent, 1, montee Notre Dame, 35400 Saint Malo, France

Filed Sep. 29, 1983, Ser. No. 537,226
Claims priority, application France, Apr. 7, 1982, 82 06038
Int. Cl.³ F24H *1/20*
U.S. Cl. 126—360 A **1 Claim**



1. A method for improving the efficiency of a heating system having a submerged combustion chamber surrounded by liquid and burners connected thereto, the steps comprising:

igniting the burners;

generating forced air which flows past the ignited burners and the inside walls of the chamber thereby heating the air prior to its mixing with the liquid through a submerged outlet of the combustion chamber;

extinguishing the burners when the liquid attains a preselected temperature;

continuing to generate forced air, after the burners are extinguished, for a preselected delay time corresponding to a time interval sufficient for the walls of the combustion chamber to be cooled to a temperature at or below 100° C. thereby improving the stress resistance of the chamber;

creating a parallel branch for the forced air which extends to a point adjacent a burner ignition means;

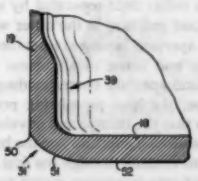
opening the branch for a preselected time interval prior to each burner ignition thereby exposing the burner ignition means to the forced air which removes liquid vapor and prevents the passage of liquid vapor from the submerged outlet to the burner ignition means which would otherwise impair burner ignition.

4,488,538

METHOD AND APPARATUS FOR MANUFACTURE OF A VESSEL

Karl Fischer, 7519 Oberderdingen, Am Gaensberg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 102,692, Dec. 12, 1979, Pat. No. 4,320,644. This application Jan. 27, 1982, Ser. No. 343,369
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1978, 2853957
Int. Cl.³ A47J *27/00*
U.S. Cl. 126—390 **4 Claims**



1. A cooking vessel, comprising:

a substantially cup-shaped stainless steel member forming a

substantially cylindrical side wall and a substantially planar bottom, the side wall and bottom being integral parts of a single piece of metal;

a lower portion of the side wall adjacent the bottom having an inwardly directed annular shoulder which is thicker than the remainder of the side wall;

the bottom being thicker than any part of the side wall, the outer surface of the lower portion of the side wall terminating in an edge defining a thin, inwardly-directed annular shoulder; and,

the cylindrical wall being roller-stretched in an axial direction, the wall having an outer surface formed by a roller compression process and having increased strength and toughness as well as a substantially crack-free surface with a bright finish.

4,488,539

SOLAR COLLECTOR UNIT

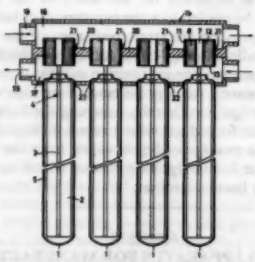
Wilhelmus H. P. Lacassen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 6, 1983, Ser. No. 539,354

Claims priority, application Netherlands, Nov. 19, 1982, 8204482

Int. Cl.³ F24J 3/02

U.S. Cl. 126—433 **2 Claims**



1. Apparatus for collecting and transferring solar heat to a medium to be heated, which comprises a heat pipe having an evaporator part and a condenser part; a solar heat absorber plate in thermally conductive contact with the evaporator part; an evacuated transparent envelope surrounding the absorber plate and the evaporator part; means on the condenser part for increasing its heat-transferring area; a duct section for the medium to be heated, said duct section being constituted by an inlet duct and an outlet duct separated by a wall having a first aperture; a second aperture in the outer wall of the duct section, said second aperture having at least the same diameter as the first aperture and being in alignment therewith, the diameter of the second aperture corresponding to that of the transparent envelope; the heat pipe being positioned in the aligned apertures so that the transparent envelope is in sealing engagement with the second aperture and the heat-transferring area-increasing means extends through the first aperture; and a wall surrounding said area-increasing means and engaging the first aperture; the area-increasing means being so constructed that the medium to be heated can flow over such means from the inlet duct to the outlet duct.

4,488,540

SOLAR HEATING SYSTEM, AND IMPROVED HEAT COLLECTING AND RADIATING COMPONENTS, FOR LIVESTOCK-CONFINING BUILDINGS

Roy E. McAlister, 5285 N. Red Rock Dr., Phoenix, Ariz. 85018

Division of Ser. No. 304,877, Sep. 23, 1981, Pat. No. 4,401,105. This application Jun. 1, 1983, Ser. No. 500,076

Int. Cl.³ F24J 3/02

U.S. Cl. 126—438 **15 Claims**

1. A structure of the type described comprising:

a plurality of self-contained, self-supporting, weather-resistant, light-weight solar energy collector panels, each of said panels comprising

means defining a plurality of like parallel troughs having their tops disposed in a common plane and provided with substantially flat outwardly-inclined side walls provided with surfaces to reflect solar energy impinging thereon toward the center of the corresponding trough;

a translucent tube supported in each trough for receiving solar radiation both direct and reflected from said reflective side wall surfaces; and

headers connecting said tubes at each end thereof, whereby heat absorbing fluid may be passed into one header, through said tubes to be heated by solar radiation and out of the other header,

said panels being arranged side-by-side with their headers aligned,

a plurality of small tubes extending longitudinally along and secured to each header, the small tubes on each panel being aligned with those of adjacent panels;

a wire extending through each set of aligned small tubes; and

gripper means fastened to each wire and bearing against the end of the corresponding small tubes of the outermost panels.

4,488,541

THERAPEUTIC ADAPTER

Juan A. S. Garcia, P.O. Box 36805, Houston, Tex. 77236

Filed Dec. 9, 1982, Ser. No. 448,249

Int. Cl.³ A61F 5/00

U.S. Cl. 128—79 **15 Claims**

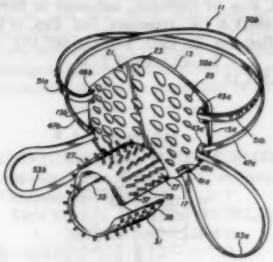
1. A therapeutic adapter for use by a male wearer, which comprises:

a sheetlike flexible pubic shield having bottom and side margins, said bottom margin being formed to define a semicular notch adapted to partially surround the base of the penis of said male wearer;

a plurality of projections affixed to one side of said pubic shield;

a tubular portion attached to said pubic shield and projecting away from said pubic shield in the same direction as said plurality of projections, said tubular portion having an upper semicylindrical section attached to said pubic shield around said notch, and a lower semicylindrical section attached along one side thereof to one side of said upper tubular portion and means for detachably attaching the other side of lower semicylindrical section to the other side of said upper semicylindrical section;

and means for attaching said pubic shield to said male wearer with said notch positioned partially around the base of the



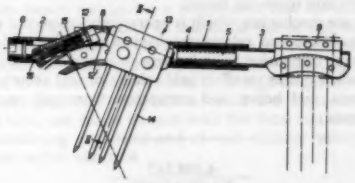
penis of said male wearer with said projections projecting away from said male wearer.

4,488,542

EXTERNAL SETTING AND CORRECTION DEVICE FOR THE TREATMENT OF BONE FRACTURES

Per Helland, Astrids vei 43, 4600 Kristiansand S, Norway

Filed Nov. 16, 1982, Ser. No. 441,994
Claims priority, application Norway, Nov. 27, 1981, 814051
Int. Cl.³ A61F *5/04;* A61B *17/18*
U.S. Cl. 128—92 A **7 Claims**



1. A device for external correction and setting of bone parts at the site of a fracture, comprising a rigid rod, adjustable in length, intended during use to lie outside the skin, and two holders fastened to the rod and carrying a plurality of transcutaneous pins which are intended to penetrate the skin and muscle tissue around the fracture site so that the free ends of the pins may be secured in holes bored in the bone parts, the pins of one holder adapted for entering the bone above the fracture and the pins of the other holder adapted for entering below the fracture, each holder being rotatable in two planes disposed at right angles to each other, characterized in that on each of the holders an arc-shaped guide is provided in a plane parallel to the axis of the rod, that each guide has a radius which approximately corresponds to the presumed distance between the center of the bone and the arc-shaped guide, that on the convex surface of the curved guide, facing away from the pins, the guide is provided with worm wheel teeth, that a worm is mounted on each of the holder parts for engagement with the teeth on the guide, that each of the holders is composed to two parts, a first part being fastened to the rod above the arc-shaped guide and a second part supporting the pins and rotatably connected to the first part about an axis of rotation disposed at a right angle relative to the axis of the arc-shaped guide, and that the pins are disposed at an acute angle in relation to the axis of rotation of the second holder part, the centerlines of the pins intersecting said axis of rotation at the latter's point of intersection with the axis of the arc-shaped guide.

4,488,543

DEVICE FOR OSTEOSYNTHESIS OF FRACTURES OF THE EXTREMITIES OF THE FEMUR

Alain Tornier, Isères, France, assignor to Tornier S.A. France, St. Ismier and Jean Butel, Meylan, both of, France

Filed Jan. 19, 1983, Ser. No. 459,250
Claims priority, application France, Jan. 19, 1982, 82 01126
Int. Cl.³ A61F *1/04;* A61B *17/18*
U.S. Cl. 128—92 BB **4 Claims**

1. In a device for osteosynthesis of the fractures of the extremities of the femur of the type having a plate including a plurality of holes and a screw for insertion in each hole to insure rigid attachement between the parts of the fractured bone and the plate, the improvement comprising:

one end of said plate being attachable to one of the extremities of the femur being wider than the other end, said wider end including three holes arranged in an isosceles triangle, the heads of said screws having the shape of a truncated cone, and said holes exhibiting a complementarily shaped recess so that each recess can house the head of a said screw,

said wider end defining a plane which forms, with the plane of the rest of said plate, an angle between 160° and 175°, and

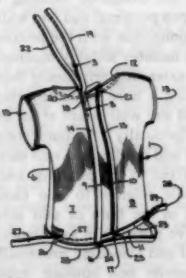
a threaded opening at the center of the triangle formed by said three conical holes, and an auxiliary screw for insertion through said opening, and a disk, the outer diameter of said disk partially covering the conical heads of said three screws when carried in said three conical holes.

4,488,544

BODY RESTRAINT FOR INVALID PATIENTS AND THE LIKE

David Triunfol, 2001 N. 72 Ct., Elmwood Park, Ill. 60635

Filed Dec. 15, 1982, Ser. No. 450,073
Int. Cl.³ A61F *13/00*
U.S. Cl. 128—134 **6 Claims**



1. A wrap around restraint for invalid patients and the like, comprising, in combination:

(a) a generally unitary vest body having a front panel which merges rearwardly into outer and inner back panels which

normally overlap along generally vertical outer and inner edge portions respectively,

(b) said front and back panels forming a lower horizontal edge portion at the waist of the vest body,

(c) first and second reinforcing straps attached to said inner back panel at the upper end of said inner vertical edge portion and on the horizontal edge portion thereof, respectively, and with each said strap having an attachment terminus with a free strap end extending beyond said terminus,

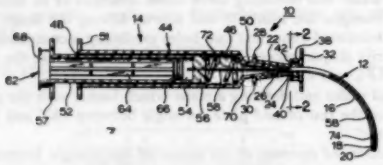
(d) and slots disposed in said outer back panel at the upper end of said outer vertical edge portion and on the horizontal edge portion thereof for threadably receiving the respective said free strap ends from beneath and outwardly therethrough for attachment to a bed or the like.

4,488,545

CATHETER PLACEMENT DEVICE

S. Nancy Shen, St. Louis, Mo., assignor to Sherwood Medical Company, St. Louis, Mo.

Filed Dec. 10, 1982, Ser. No. 448,449
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—200.26 **19 Claims**



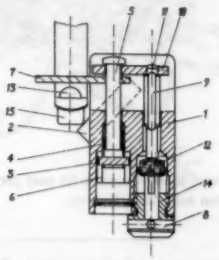
1. A catheter placement device comprising a cannula having a proximal end and a distal end, a cannula introducer needle having a proximal end and a distal end slideable in and removable from said cannula and having a lumen therethrough and a pointed tip at the distal end thereof, and means for manually moving said needle distally into an extended position in said cannula in which said tip is disposed distally of the distal end of said cannula for passing the distal ends of said needle and said cannula through body tissue and into a desired body location and for moving said needle proximally from the extended position to a retracted position in which said tip is disposed within said cannula, said means for manually moving said needle including an elongated housing having a chamber therein with an open proximal end and wall means at the distal end thereof for connection with the proximal end of said cannula, an actuating member slidably mounted in the chamber of said housing and extending proximally therefrom, said actuating member having a bore extending therethrough with an open proximal end and wall means at the distal end thereof for connecting and fluidically communicating the bore thereof with the lumen of said needle, said wall means of said actuating member being affixed to the proximal end of said needle for moving said needle relative to said cannula, piston means slidably mounted in the bore of said actuating member for effecting a negative pressure in said lumen, said piston means having a proximal end extending proximally from said actuating member, whereby said housing, actuating member and piston means are arranged telescopically one within the other and further include, at each proximal end thereof, gripping means adapted to be engaged by the fingers, and resilient means for biasing said actuating member and therefore, said needle from the extended position to the retracted position.

4,488,546

RELEASE MECHANISM FOR RETENTION MEANS FOR OXYGEN MASKS

Jost Bernhardt, Hamburg, and Georg Hase, Wedel/Holstein, both of Fed. Rep. of Germany, assignors to Bernhardt Apparatebau GmbH & Co., Hamburg, Fed. Rep. of Germany

Filed Jun. 23, 1983, Ser. No. 507,172
Int. Cl.³ A62B *7/00*
U.S. Cl. 128—201.23 **10 Claims**



1. In combination with a retention means adapted to be connected between an oxygen mask and head supporting means, which retention means includes a cartridge-like receiving means adapted to be supported to said head supporting means and a connector adapted to be connected to said oxygen mask; said retention means further including tensioned securing elements which removably hold said connector in said receiving means; bracket means being attached to said connector for releasing said securing elements, and hence said connector, from said receiving means;

a release mechanism which is operatively connected to said connector, said release mechanism including self-acting means responsive upon immersion in water, to shift said bracket means to effect said release of said securing elements, and hence said connector, from said receiving means.

4,488,547

FACE MASK

Beatrice R. Mason, Pittsburgh, Pa., assignor to Kenneth R. Bowers, Jr., Bryn Mawr, Pa.

Filed Sep. 7, 1982, Ser. No. 415,748
Int. Cl.³ A62B *7/00*
U.S. Cl. 128—202.22 **4 Claims**

1. A surgical face mask having a barrier of permeable material fitted to cover the mouth and nose of the user thereby interdicting respired air and filtering bacteria therefrom, said barrier having means for attachment to the user's face, and said barrier comprising a layer of bacterial filtration material for removal of bacteria from respired air, said filtration material

being of a first color, having hygroscopic material partially covering a surface of said layer of filtration material, for the absorption of water from respired air which absorption causes said hygroscopic material to change color to a second color not identical to said first color, said hygroscopic material having a mass content appropriate to cause said color change to occur after a time duration of use of said mask to signal by said color change to the user and to others that use of said mask should be terminated due to accumulation of bacteria.

4,488,548

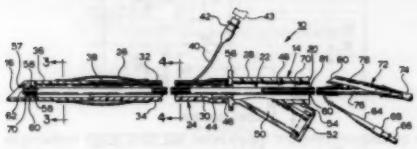
ENDOTRACHEAL TUBE ASSEMBLY

Ronald T. Agdanowski, St. Peters, Mo., assignor to Sherwood Medical Company, St. Louis, Mo.

Filed Dec. 22, 1982, Ser. No. 452,246

Int. Cl.³ A61M *16/00*

U.S. Cl. 128—204.25 **13 Claims**



1. An endotracheal tube assembly for effecting high frequency jet ventilation of a patient comprising an endotracheal tube having a tube lumen extending therethrough and a distal end for insertion into the trachea of a patient, and a proximal end adapted to be disposed externally of the patient when said distal end is in the trachea, a catheter slidably extending into said tube lumen and having a length such that the distal end thereof is located adjacent to said distal end of said tube and the proximal end thereof extends from the proximal end of said tube, said proximal end of said catheter including means adapted to be connected to a source of high frequency pulsating gas, said catheter being slidable relative to the entire length of said tube, and means integral with the distal end of the tube for maintaining said distal end of said catheter substantially centered within said tube.

4,488,549

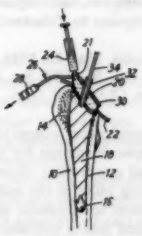
PRESSURIZATION OF CEMENT IN BONES

Alan J. C. Lee, and Robin S. M. Ling, both of Exeter, England, assignors to University of Exeter, Devon, England

Filed Aug. 17, 1982, Ser. No. 408,815

Int. Cl.³ A61F *1/00*; A61B *17/36*

U.S. Cl. 128—303 R **12 Claims**



1. Apparatus for use in pressurization of cement in a cavity in a bone, said apparatus comprising a seal member for fitting over and sealing the opening of the cavity, said seal member being deformable and having an upper and lower substantially planar surfaces and further including a transverse aperture for sealingly receiving a cement delivery nozzle extending through a central region thereof, said seal member being dimensioned and arranged so as to be urgeable transversely, with a said nozzle extending through said aperture in sealing relationship with the portions of said seal member defining the aperture, with deformation of the seal member, said lower planar surface disposed in substantially coplanar relationship with the surfaces of the bone defining the opening of the cavity so as not to invade the cavity and to extend beyond the edges the opening of the cavity to contact the surfaces of the bone defining the cavity to provide sealing around the cavity, said seal member further providing sealing directly around the delivery nozzle, whereby cement under pressure can be passed through the nozzle into the sealed cavity and provide complete filling of the cavity.

4,488,550

TATTOOING DEVICE AND PROGRAM CARRIER THEREFORE

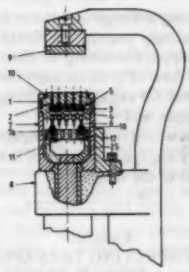
Halbe J. Niemeijer, Bruntinge, Netherlands, assignor to Dawsonville Corporation N.V., Netherlands

Filed Jul. 19, 1982, Ser. No. 399,329

Claims priority, application Netherlands, Jul. 21, 1981, 8103433

Int. Cl.³ A61D *1/00*; B44B *5/00*; B43K *5/00*

U.S. Cl. 128—316 **12 Claims**



1. A tattooing device for marking animals by the device of a contrasting fluid into tissue of the animal, said device comprising:

a needle carrier;

a plurality of hollow needles carried by said needle carrier, said needles being arranged in a matrix capable of forming marking symbols from combinations of selected ones of said needles, said needles being movable with respect to said needle carrier to an extended position for insertion into the tissue of the animal;

an exchangeable program carrier having a plurality of cavities containing the contrasting fluid and alignable with selected ones of said needles; and

operating means receiving said needle carrier and program carrier for relatively moving said program carrier and needle carrier toward and away from each other;

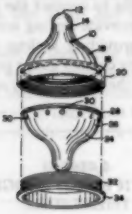
said cavities containing the contrasting fluid being at least partly closed by a closing element, the movement of said program carrier and said needle carrier toward each other bringing said needles into abutment with said program carrier to extend said selected ones of said needles for insertion in the tissue of the animal to be marked, said closing elements being at least partially deformable by the relative movement of said program carrier and needle carrier for injecting the contrasting fluid from said cavities through said extended needles into the animal tissue, the deformation of the closing elements requiring a greater force than that required to insert the needles into the animal tissue.

4,488,551

PACIFIER WITH FLOW REGULATING MEANS

Robert W. Connelly, 312 Charing Cross Rd., Elk Grove Village, Ill. 60007

Filed Jul. 19, 1982, Ser. No. 399,500
Int. Cl.³ A61J 7/00, 11/02, 11/04, 17/00
U.S. Cl. 128—360 5 Claims



1. A resealable fluid-containing pacifier for regulating the fluid intake of an imfant comprising:

(a) a chamber portion closed at a lower end and open at an upper end, said chamber portion including an outwardly extending flange and a plurality of openings at the upper end thereof;

(b) a nipple having a flange about the lower end thereof adapted to sealingly engage the flange of said chamber portion, said nipple containing an absorbant material for regulating the flow of fluid through the nipple;

(c) a collar member for engaging the flange about the lower end of said nipple; and

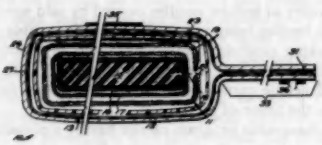
(d) locking means which removably engages the collar member to sealingly engage the flange of the chamber portion with the flange of the nipple.

4,488,552

METHOD OF APPLYING THERAPEUTIC HEAT

Michael G. McCann, and Betty R. McCann, both of Jacksonville, Fla., assignors to Micropak Manufacturing, Inc., Orange Park, Fla.

Filed Apr. 28, 1982, Ser. No. 372,704
Int. Cl.³ A61F 7/00
U.S. Cl. 128—402 8 Claims



1. A method of applying therapeutic heat to a mammal body part utilizing a heat pack including a liquid-absorbing inner core, a liquid-impervious microwave-transparent inner bag, and an outer microwave-transparent covering, comprising the steps of substantially sequentially:

(a) applying liquid to the core so that it is substantially saturated;

(b) disposing the core in the inner bag, and closing the bag;

(c) disposing the closed inner bag and core in the outer covering;

(d) disposing the heat pack in operative association with a microwave source to heat the liquid associated with the core; and

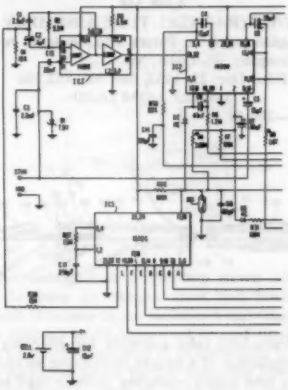
(e) removing the heat pack from association with the microwave source and placing it in contact with a body part to be treated.

4,488,553

EXTERNALLY CONTROLLED TACHYCARDIA CONTROL PACER

Tibor A. Nappholz, Drummoyne, and Stephen J. Swift, Hornsby, both of Australia, assignors to Telectronics Pty. Ltd., Lane Cove, Australia

Division of Ser. No. 245,356, Mar. 19, 1981, Pat. No. 4,407,289.
This application Jul. 26, 1982, Ser. No. 402,026
Int. Cl.³ A61N 1/36
U.S. Cl. 128—419 PG 5 Claims



1. A tachycardia control pacer comprising means for confirming a tachycardia episode, means for timing a time delay, means responsive to said confirming means for generating at least one heart-stimulating pulse at the end of said time delay following the last heartbeat to terminate said tachycardia episode, means for scanning said time delay through a range during successive cycles of operation of said pulse generating means, externally-controlled means for changing the range through which said time delay is scanned in accordance with externally-generated signals, and means responsive to operation of said externally-controlled means for causing the next time delay to be dependent upon only a time delay last represented by the externally-generated signals and independent of the last time delay controlled by said scanning means.

4,488,554

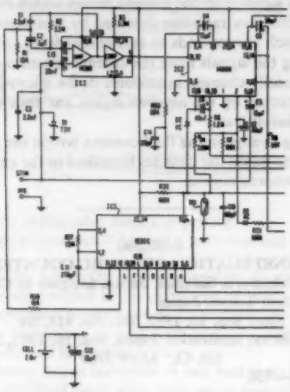
EXTERNALLY-INHIBITED TACHYCARDIA CONTROL PACER

Tibor A. Nappholz, Drummoyne, and Stephen J. Swift, Hornsby, both of Australia, assignors to Telectronics Pty. Ltd., Lane Cove, Australia

Division of Ser. No. 245,356, Mar. 19, 1981, Pat. No. 4,407,289.
This application Jul. 26, 1982, Ser. No. 402,204
Int. Cl.³ A61N 1/36
U.S. Cl. 128—419 PG 7 Claims

1. A tachycardia control pacer comprising means for confirming a tachycardia episode, means for timing a time delay, means responsive to said confirming means for generating at least one heart-stimulating pulse at the end of said time delay following the last heartbeat to terminate said tachycardia episode, externally-controlled means operable by external means independent of said pulse generating means operation for inhibiting operation of said pulse generating means only for as long as said external means exercises control thereover, means for causing said timing means to scan said time delay during successive cycles of operation of said pulse generating means following operation of said confirming means, program control means for controlling a range through which said time delay is scanned in accordance with externally-generating signals which represent a specific time delay in said range, and

means responsive to operation of said program control means for causing the next time delay of said timing means to be



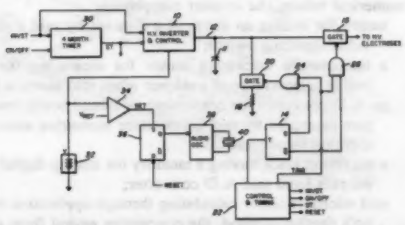
dependent upon only the time delay last represented by externally-generated signals and independent of the last time delay controlled by said scan causing means.

4,488,555

BATTERY CONDITION WARNING SYSTEM FOR MEDICAL IMPLANT

Mir Imran, Pittsburgh, Pa., assignor to Mieczyslaw Mirowski, Owings Mills, Md.

Filed Dec. 13, 1982, Ser. No. 449,229
Int. Cl.³ A61N *1/36*
U.S. Cl. 128—419 PT **6 Claims**



1. A battery condition warning system in combination with a battery powered medical implant, including a treating circuit activated by an event signal generated in response to the onset of a medical condition or a self-test signal for respectively performing a treating function to a patient or to an internal test load, said system comprising:

resettable timer means for generating said self-test signal after a predetermined time period, said timer means being reset upon each assertion of said event signal;

control means responsive to said self-test signal to cause said treating circuit to perform said treating function to said internal test load;

monitoring means for monitoring the voltage potential of said battery during activation of said treating circuit and for producing an alarm signal when said voltage potential falls below a predetermined level; and

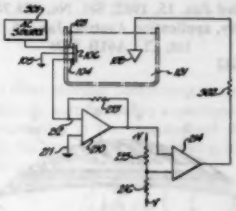
alarm means responsive to said alarm signal for producing an alarm.

4,488,556

AC MODE OPERATION OF CHEMFET DEVICES

Nelson Ho, West Valley, Utah, assignor to Critikon, Inc., Tampa, Fla.

Filed Jun. 3, 1982, Ser. No. 384,710
Int. Cl.³ G01N *27/30*
U.S. Cl. 128—635 **8 Claims**



1. In combination, a chemically sensitive field effect transducer apparatus, means for coupling a sinusoidal drain-source potential to said transducer, and means for maintaining the gate of said transducer at a DC potential equal to the combination of a bias potential plus an electrochemically generated potential by a substance being sensed.

5. Apparatus for sensing the presence of a specified substance in a subject comprising:

(a) a chemically sensitive field effect device having respective drain and source connections, a drain to source conduction path, and a chemically selective system overlying said path and modulating current therein in response to presence of said substance in said subject;

(b) a reference electrode coupled to said subject;

(c) means for generating and for coupling to said conduction path a sinusoidal time variant signal; and

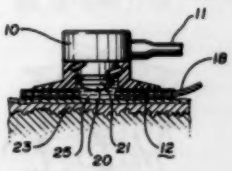
(d) means, coupled between said source and said reference electrode, for establishing a gate potential consisting of a bias potential plus the potential generated electrochemically by said specified substance.

4,488,557

TOPICAL AGENT FOR TRANSCUTANEOUS MEASUREMENT OF PARTIAL PRESSURE OF OXYGEN

Rolf R. Engel, 3265 N. Snelling, Arden Hills, Minn. 55112

Filed Mar. 2, 1984, Ser. No. 585,774
Int. Cl.³ A61B *5/00*
U.S. Cl. 128—635 **10 Claims**



1. A method for transcutaneous measurement of arterial partial pressure of oxygen comprising:

applying topically 2-thenoyltrifluoroacetone to an area of skin over which the partial pressure of oxygen is to be measured;

placing a sensor unit over the area of skin to which the 2-thenoyltrifluoroacetone has been applied and sealing the area of skin from the ambient atmosphere;

raising the temperature of the area of skin by heat emanating from the sensor unit; and

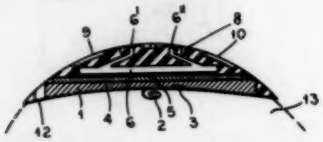
measuring with the sensor unit the transcutaneous partial pressure of oxygen over the area of skin.

4,488,558

BIRTH MONITOR

Georg Simbruner, and Rudolf Rudelstorfer, both of Vienna, Austria, assignors to Innova Wiener Innovationsgesellschaft m.b.H., Vienna, Austria

Filed Jun. 15, 1982, Ser. No. 388,740
Claims priority, application Austria, Jun. 16, 1981, 2678/81
Int. Cl.³ A61B 5/04
U.S. Cl. 128—642 **13 Claims**



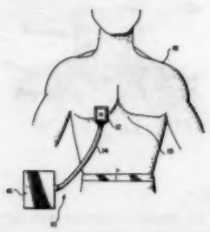
1. In a system for monitoring the birth of an infant which comprises a sensor provided with at least one intrusion electrode adapted to be affixed to a portion of the body of an infant during parturition and providing an ekg output, said sensor including a support member having a first side carrying said intrusion electrode and adapted to lie against the skin of said infant and a second side opposite thereto, the improvement which comprises a heat-flow detector on said member, responsive to the heat flow from the skin of the infant for generating an output signal at least upon a deviation of said heat flow from a normal value, and means responsive to said detector for signaling such deviation, said detector comprising a heat-flow plate formed on the first side of said member and engageable with said infant, a pair of thermoelements disposed on opposite sides of said plate, and means for creating a thermal condition at least on a side of said plate turned away from the infant whereby a temperature differential detector between said thermoelements represents said heat flow from the skin of the infant.

4,488,559

APPARATUS AND METHOD FOR MEASURING LUNG WATER CONTENT

Madgy F. Iskander, Salt Lake City, Utah, assignor to University of Utah, Salt Lake City, Utah

Filed Jun. 30, 1981, Ser. No. 279,102
Int. Cl.³ A61B 5/08
U.S. Cl. 128—653 **20 Claims**



1. A method for measuring change in fluid content within an animal body comprising the steps of:

obtaining an antenna means responsive to microwave radiation;

positioning the antenna means so as to detect microwave radiation emitted from the animal body, wherein said microwave radiation corresponds to emissivity of the body in regions being monitored, with said emissivity being influenced by the fluid content within said animal body;

emitting a signal from the antenna means which correlates to the microwave radiation detected by said antenna means and which corresponds to said emissivity;

comparing the signals from the antenna means over time so as to identify changes in amounts of the microwave radiation detected by the antenna means and thus changes in the emissivity; and

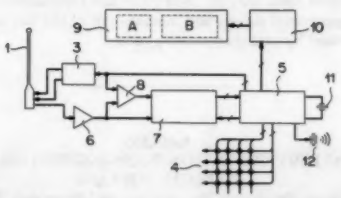
identifying change in the fluid content within the monitored region based on the changes identified in the emissivity of the monitored region.

4,488,560

MENSTRUATION PERIODIC COUNTER

Takatsugu Takamura, Saitama, Japan, assignor to Colpo Company Limited, Tokyo, Japan

Filed Sep. 10, 1982, Ser. No. 416,709
Claims priority, application Japan, Sep. 19, 1981, 56-148028
Int. Cl.³ A61B 5/00
U.S. Cl. 128—738 **5 Claims**



1. A menstruation periodic counter, including a first indicator for indicating a calendar and a second indicator, and an operation switch comprising a switch for switching contents shown in the said second indicator and a switch for inputting numerical values, the counter comprising:

means for issuing an alarm at a time set by said numerical value inputting switch;

a temperature measuring sensor for measuring the basal bodily temperature of a subject when said alarm is issued;

an A-D converter for converting said basal bodily temperature measured by said temperature measuring sensor into a digital signal; and

a microprocessor having a memory for storing digital signal outputs from said A-D converter;

said microprocessor calculating through application of Ogino's rhythm method, the conceptive period from a menstruation beginning data value input from said operation switch;

said microprocessor determining from the basal bodily temperature signals the conceptive period when the number of measurements made by said temperature measuring sensor exceeds a number representing the length in days of the menstruation period; and

said microprocessor correcting the conceptive period calculated by said Ogino's method by the conceptive period determined from said basal bodily temperature outputs, and indicating the corrected conceptive period on the said first indicator,

said microprocessor discriminating by using said Ogino's method and said menstruation beginning data value the condition of a high temperature or a low temperature period in the subject, and providing a signal indicative thereof, and

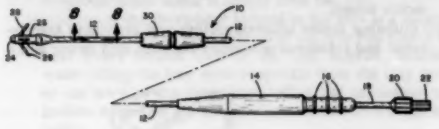
means responsive to said signal for adjusting the output range of said A-D converter.

4,488,561

PACING LEAD WITH INSERTABLE MEMORY COIL

John D. Doring, Spring Lake Park, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Jun. 27, 1983, Ser. No. 507,653
Int. Cl.³ A61N *1/36*
U.S. Cl. 128—786 **13 Claims**



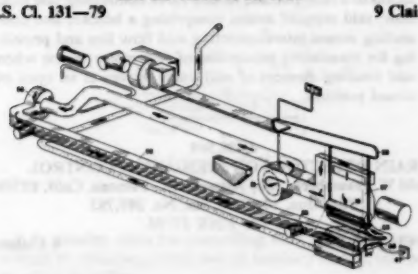
1. A body implantable lead, comprising:
an electrical conductor having a proximal end and a distal end;
an insulative lead body enclosing said conductor;
an electrode coupled to the distal end of said conductor;
curve imparting means tending to assume a predetermined curve, insertable in said lead body for imparting said curve to said lead body;
straightening means insertable in said lead body for straightening said lead body when said curve imparting means is fully inserted in said lead body; and
retaining means removably insertable in said lead body for retaining said curve imparting means within said lead body while said straightening means is completely removed from said lead body.

4,488,562

CIGARETTE MAKING WITH TEMPERATURE CONDITIONING

James A. Remington, Richmond, Va., assignor to Philip Morris, Incorporated, New York, N.Y.

Filed Aug. 3, 1982, Ser. No. 404,784
Int. Cl.³ A24C *5/02*, *5/18*
U.S. Cl. 131—79 **9 Claims**



1. A method of making a smoking product including a rod of smoking material comprising the following steps:
a. preparing a filler for a smoking product;
b. tempering said filler by adjusting the temperature of said filler to a below-ambient level; and
c. forming a rod of smoking product of said tempered filler in a cigarette making machine comprising a feed hopper while said filler is at said below-ambient temperature level so as to stiffen said rod prior to cutting, said filler being cooled to said below-ambient temperature prior to exit from said hopper.

4,488,563

FILTER PLUG

Kazuhiko Morifuji; Hirohumi Okura, and Takashi Sakai, all of Toyama, Japan, assignors to Mitsubishi Acetate Co., Ltd. and Mitsubishi Rayon Co., Ltd., both of Tokyo, Japan

Filed Apr. 29, 1982, Ser. No. 373,153
Int. Cl.³ A24D *3/04*
U.S. Cl. 131—336 **9 Claims**

1. A cylindrical filter plug having an axial core of filter material and an outer skin of wrapping paper which permits air to pass therethrough,
the core comprising a first filter element and a second filter element axially arranged and jointed to each other, the first filter element comprising a crimped long fiber tow,

the second filter element comprising a core of long fiber tow peripherally surrounded by a corrugated sheet having grooves extending in the longitudinal direction of the filter plugs, the corrugated sheet having an air permeability of 0.005 to 8 liters/minute.

4,488,564

OILY COMPOSITION INTENDED FOR THE TREATMENT OF KERATIN SUBSTANCES AND THE SKIN

Jean F. Grollier, Paris, and Josiane Allec, Pierrefitte-sur-Seine, both of France, assignors to L'Oreal, Paris, France

Filed Dec. 18, 1981, Ser. No. 331,904
Claims priority, application Luxembourg, Dec. 19, 1980, 83020
Int. Cl.³ A45D *19/00*; A61K *7/06*
U.S. Cl. 132—7 **16 Claims**

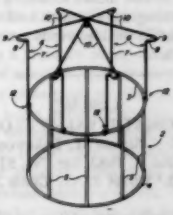
1. A single liquid phase oily and foamable composition suitable for application to keratin material and the skin comprising:
(1) about 5 to 85% of an oil compound liquid at room temperature which is selected from the group consisting of mineral oil, animal oil, vegetable oil, synthetic oil, a triglyceride of a synthetic fatty acid, a fatty alcohol or an ester of a fatty acid and an alcohol;
(2) an oil soluble surface active compound selected from the group consisting of (a) an anionic surface active agent, the acid group of which has been neutralized by an amine; (b) (a) above in combination with a non-ionic surface active agent; (c) (a) above in combination with an alkanolamide; and (d) (a) above in combination with a non-ionic surface agent and an alkanolamide;
(3) about 0.05 to 10% of a cationic product; and
(4) water in an amount equal to 5% or less by weight.

4,488,565

HAY RACK TOP

Douglas D. Smith, Rte. 3, Box 132E, West Monroe, La. 71201

Filed Feb. 7, 1983, Ser. No. 464,424
Int. Cl.³ E04G *11/04*
U.S. Cl. 135—100 **15 Claims**



1. A hay rack top for mounting on conventional hay racks comprising a plurality of brace means, each of said brace means characterized by a fastening means at one end; a substantially straight leg segment extending from said fastening means; a shoulder bend provided at the extending end of said leg segment and an arm segment extending from said shoulder bend at a selected angle with respect to said leg segment; a flange segment provided in the end of said arm segment opposite said

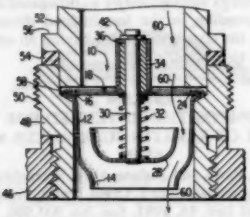
shoulder bend; cover means resting on said arm segment and extending around said shoulder bend; and securing means provided on said cover means, whereby said cover means is secured on said arm segment and around said shoulder bend.

4,488,566

THERMALLY RESPONSIVE SLAM SHUT VALVE ASSEMBLY

Irwin A. Hicks, Radnor, Pa., assignor to The Singer Company, Stamford, Conn.

Filed Jun. 22, 1983, Ser. No. 506,953
Int. Cl.³ F16K *17/00*
U.S. Cl. 137—74 **3 Claims**



1. A self-contained thermally responsive slam shut valve assembly adapted for installation in the inlet connector of a gas meter or the like, said connector having a constant diameter portion and an enlarged shoulder region adjacent said portion and away from said meter, said assembly comprising:

a generally tubular body member having an internal valve seat at one end and an outwardly extending flange at the other end, said body member being sized to be press fit into said constant diameter portion of said connector with said flange resting on said shoulder region;

a spider member having a central hub and a plurality of webs extending radially outward from said hub to the outer periphery of said spider member, the outer periphery of said spider member resting on and connected to said flange and said hub having an opening therethrough;

a cup shaped valve inside said body member;

a valve stem connected to said valve and extending through said hub opening;

a coil spring surrounding said stem between said valve and said hub and acting to bias said valve toward said valve seat; and

fusible means surrounding said stem on the side of said hub opposite said valve for preventing said valve from moving into sealing contact with said valve seat when the temperature of said fusible means is below a predetermined threshold, said fusible means softening to allow said valve to move into sealing contact with said valve seat when the temperature of said fusible means goes above said predetermined threshold.

4,488,567

AUTOMATIC VALVE CLOSER

Willie T. Grant, 400 S. Simms St., Lakewood, Colo. 80228

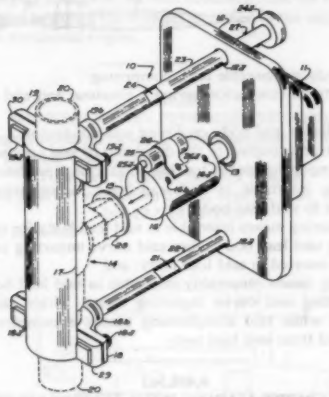
Filed Jul. 5, 1983, Ser. No. 510,756
Int. Cl.³ H01H *35/00*; G08B *21/00*
U.S. Cl. 137—78.1 **3 Claims**

1. Closure means having translatory motor means, said closure means automatically rotating a valve to a closed condition upon detection of a leak or rupture in a device having fluid flow controlled by said valve; said closure means, having covering means, comprising in combination;

(a) detection means, sensing the presence of said fluid outside the confines of said device; said detection means having a liquid containment receptacle receiving a portion of said fluid; normally open electrical contacts mounting in said receptacle, energizing relay means and said motor means coincident with a leak or rupture in said device;

(b) electrical means having secondary circuit energizing relay means and controlling a primary circuit operating motor means; said motor means comprising a low rpm motor, energized through said contacts of said relay means and de-energized through contacts operable by said motor means;

(c) coupling means interconnecting and providing translational and rotational continuity between said motor and a



rotating element of said valve; said coupling means attaching to said shaft of said motor means and to said rotating element of said valve;

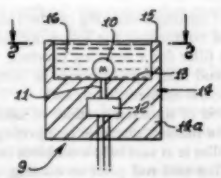
(d) support means attaching said motor means and coupling means to a flow line and to said valve controlling said fluid flow; said support means comprising a bracket and connecting means interconnecting said flow line and providing for translatory movement of said motor means when said rotating element of said valve moves to an open of closed position.

4,488,568

RAIN DETECTOR FOR IRRIGATION CONTROL

Harold W. Hasenbeck, 1524 Alameda St., Pomona, Calif. 91768

Filed Jun. 14, 1982, Ser. No. 387,783
Int. Cl.³ F16K *17/36*
U.S. Cl. 137—78.2 **4 Claims**



1. In a rain sensor system, for controlling irrigation, the combination comprising

(a) a heat diffusion sensor comprising a thermistor having a tip exposed to the atmosphere and characterized in that relatively higher heat loss created by collection of water adjacent the sensor reduces its electrical resistance, and relatively lower heat loss created by absence of such water collection increases the sensor electrical resistance, and

(b) circuitry means operatively connected with the sensor for controlling an actuator for an irrigation valve,

(c) there being a water collector tray having an interior wherein the thermistor is exposed to water collecting in the tray to be cooled by such water, the tray located above ground,

(d) said thermistor and circuitry means connected to initiate irrigation when water is absent from the tray,

(e) the top of the thermistor located in the tray at a substantial distance below the top level of the tray and above but near (rear) bottom level of the tray interior, whereby water filling the tray must evaporate from the tray down to the level of the thermistor before the thermistor will initiate irrigation via the circuitry means to actuate said valve,

(f) there being a body supporting the tray and in which said circuitry means is protectively located, whereby the body, tray and thermistor and circuitry means form a single unit.

4,488,569

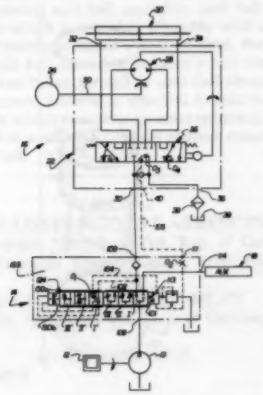
APPARATUS WITH STAGED PRESSURE DIFFERENTIAL FOR CONTROLLING FLUID FLOW

Jim L. Rau, Lafayette, Ind., assignor to TRW Inc., Cleveland, Ohio

Filed Apr. 23, 1982, Ser. No. 371,260

Int. Cl.³ F15B *13/07*; G05D *11/03*

U.S. Cl. 137—101 **4 Claims**



1. A priority valve for controlling fluid flow from a source of fluid to a steering circuit and an auxiliary circuit, said priority valve including

a housing having an inlet port for connection to the source of fluid, a priority port for connection to the steering circuit, and an auxiliary port for connection to the auxiliary circuit,

said housing having a fluid chamber communicating with said inlet port, and a valve element movable axially in said fluid chamber for controlling flow between said inlet port, said auxiliary port and said priority port,

said valve element being movable between a priority position in which all flow at said inlet port is directed to said priority port and an auxiliary position in which said valve element establishes maximum communication of said inlet port with said auxiliary port and minimum communication of said inlet port with said priority port, said valve element having intermediate positions between said priority and auxiliary positions and in which said valve element communicates said inlet port with said priority port and said auxiliary port,

means for providing a pressure differential across said valve element for moving said valve element between its priority and auxiliary positions including biasing means for biasing said valve element to its priority position and fluid pressure means for applying a force to said valve element in a direction for urging said valve element toward said auxiliary position, said fluid pressure means including a first fluid pressure cavity at one end of said valve element, means for communicating fluid pressure to said first fluid pressure cavity for acting on said one end of said valve element for moving said valve element between said priority and auxiliary positions, and means communicating the fluid pressure in said first fluid pressure cavity to a first area of said one end of said valve element when said valve element is in an intermediate position and means communicating the first fluid pressure to a second area of said one end of said valve element which is less than said first area for changing the pressure differential for moving the valve element when the valve element is in said priority position, whereby the pressure differential required for moving said valve element when said valve element is in said priority position is greater than the pressure differential required when said valve element is in the intermediate position.

4,488,570

BLENDING APPARATUS AND METHOD

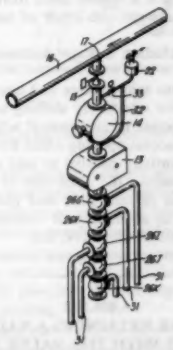
Joost J. Jiskoot, Tunbridge Wells, England, assignor to Jiskoot Autocontrol Limited, Tunbridge Wells, England

Filed Jun. 15, 1983, Ser. No. 504,433

Claims priority, application United Kingdom, Jun. 16, 1982, 8217442

Int. Cl.³ F16K *19/00*

U.S. Cl. 137—238 **7 Claims**



1. An in-line blender for blending components in the form of liquid or other fluent materials, comprising:

a pipeline having a plurality of injection points;

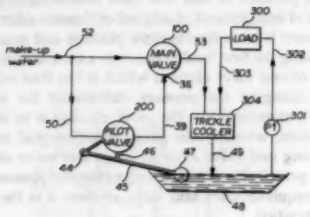
a respective set of selector valves in series with and adjacent to one another connected to each injection point, each selector valve being movable between a first position for connecting an outlet of the selector valve with a respective component supply, and a second position for interconnecting the selector valve with the adjacent downstream and upstream selector valves, the selector valve of each set of selector valves which is furtherst downstream being connected to a metering apparatus and thence to the associated injection point; and

means for controlling the selector valves, so that only one of the selector valves in each set of selector valves is in the first position and the others are in the second position during operation and so that, for each set of selector valves, the component from said only one of the selector valves is metered to the associated injection point.

4,488,571
FLOW-CONTROL SYSTEM WITH PRESSURE-RESPONSIVE VALVE

Hans H. Sladky, Fabriciusstrasse 16, 2000 Hamburg 71, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 403,707, Jul. 30, 1982,. This application Mar. 22, 1983, Ser. No. 477,825
Int. Cl.³ F16K *43/00, 31/26*
U.S. Cl. 137—315 **18 Claims**



1. A flow-regulating valve comprising:

a valve body provided with an entrance port and an exit port interconnected by a channel;

shutter means in said channel including an apertured slide, movable between a blocking position and an unblocking position, and an apertured plate adjoining said slide in a contact plane which includes an angle significantly different from 90° with an axis of at least one of said ports, said plate being removably mounted in a seat of said body open toward said one of said ports, said body being further provided with a restricted passage extending parallel to said contact plane to a remote space from a location in said channel lying between the other of said ports and said shutter means;

control means including a stem disposed in said remote space;

a rod extending into said passage and connecting said stem with said slide for selectively shifting same between said positions in response to an external actuating force, said body having an access opening offset from said one of said ports and substantially parallel to said contact plane and said stem confronting the open side of said seat and enabling extraction of said slide and plate from said rod individually or as a single unit without disturbing any other components of the valve; and

removable cover means sealing said access opening.

4,488,572
APPARATUS FOR RETAINING A VALVE BODY IN ENGAGEMENT WITH THE VALVE NECK OF A PRESSURIZED CONTAINER

Anthony D. Brown, Woodland Hills, and Vincent J. Cerrato, Camarillo, both of Calif., assignors to Grundy Dispense Systems, Inc., Canoga Park, Calif.

Filed Jul. 18, 1983, Ser. No. 514,784
Int. Cl.³ F16K *43/00*; F16L *37/00*; B65D *83/00*
U.S. Cl. 137—315 **2 Claims**

1. An apparatus for retaining a valve body in engagement with the valve neck of a container, wherein the valve neck is of generally hollow cylindrical configuration including a top surface and an inner surface with an annular groove extending around the entire inner surface at a location adjacent the top of the valve neck and a keyway within said inner surface and extending from the top of the valve neck through the annular groove and to a distance below the annular groove and further characterized by a lower annular shelf protruding radially inward of the bottom of the valve neck, and wherein the valve body is of generally cylindrical configuration and is characterized by an upper cylindrical portion which contains an exterior surface and a key located adjacent its top and extending radially outward of its exterior surface and further containing a flexible seal adjacent its bottom, wherein the apparatus for retaining the valve body in engagement with the valve neck comprises:

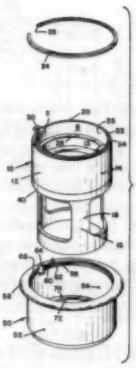
a. said upper cylindrical portion of said valve body containing an annular step on its top surface which defines an annular top shoulder extending around the outer circumference of the top and an internal wall adjacent the annular top shoulder and extending around the entire circumference of the inner periphery of the annular top shoulder;

b. a split retaining ring whose opening is approximately equal to the width of said key on said valve body;

c. the diameter of said split retaining ring being approximately equal to the outer diameter of said annular groove in said valve neck;

d. the width of said split retaining ring being approximately equal to the combined widths of said annular groove and said annular top shoulder; and

e. said split retaining ring being accommodated within said annular groove such that a portion of the split retaining ring lies within the annular groove and a portion of the split retaining ring extends radially inward of the internal valve neck surface for a distance approximately equal to



the width of the annular top shoulder of the valve body and the ends of the retaining ring abutting said key;

f. wherein when said valve body is inserted into said valve neck such that said key on said valve body is aligned with said keyway of said valve neck and said flexible seal rests against said lower annular shelf on said valve neck, pressure on said valve body depresses said valve body into said valve neck by a distance sufficient to enbable the top of the internal wall in said valve body to lie below said annular groove in said valve neck, at which time said retaining ring can be inserted into said annular groove such that the gap in said retaining ring is aligned with said keyway, and when the pressure on the valve body is removed said flexible seal forces said valve body upwardly until the annular top shoulder on said valve body comes into contact with said retaining such that the retaining ring lies on said top annular shoulder to said valve body and abuts said internal wall of the valve body, such that the annular ring surrounds and abut the key on said valve body and is in the same plane as the key on the valve body to prevent any tampering and removal of the retaining ring.

4,488,573

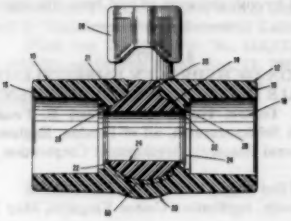
APPARATUS FOR PREVENTING THERMAL DAMAGE TO A PREFORMED PLUG DURING MOLDING OF A HOUSING THEREAROUND

Gary L. Runyan, and Paul H. Sloan, Jr., both of Louisville, Ky., assignors to Nibco Inc., Elkhart, Ind.

Division of Ser. No. 314,271, Oct. 23, 1981, Pat. No. 4,430,285. This application Jul. 13, 1983, Ser. No. 513,445

Int. Cl.³ F16K *5/06*

U.S. Cl. 137—375 9 Claims



1. A ball valve assembly suitable for use in a molding operation wherein molten polymeric material is introduced into a mold cavity around said ball assembly to produce a formed-in-place housing around said ball assembly, said ball assembly including a bore which is rotatably alignable with a through-passage of the housing to admit a flow of fluid, the improvement wherein said ball assembly includes a ball element of a polymer, said bore being formed in said ball element, and a shield of a polymeric material is attached to said ball element by a snap-lock fit which maintains an inner spherical surface of said shield against a correspondingly shaped outer spherical surface of said ball.

4,488,574

PRESSURE CONTROL VALVE ARRANGEMENT

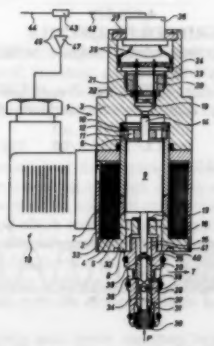
Reiner Bartholomäus, Neuendorf, Fed. Rep. of Germany, assignor to Mannesman Rexroth GmbH, Lohr, Fed. Rep. of Germany

Filed Aug. 4, 1982, Ser. No. 405,101

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1981, 3136174

Int. Cl.³ G05D *16/20*

U.S. Cl. 137—487.5 5 Claims



1. A pressure control valve arrangement, comprising a valve housing bounding a bore centered on an axis; a slide valve axially displaceable in said bore and having two axial end faces one of which delimits a controlled pressure compartment in said bore; a magnet housing rigid with said valve housing; a proportional magnet accommodated in said magnet housing and including a tappet magnetically displaceable in the axial directions of said bore and acting on the other of said axial end faces of said slide valve; a pressure indicator received in said magnet housing at the opposite axial side of said proportional magnet from said slide valve, including a pressure-responsive member, and operative for generating a pressure-indicative signal; means for admitting the pressure prevailing in said controlled pressure compartment of said bore through said proportional magnet at least to said pressure-responsive member of said pressure indicator to act thereon and to cause said pressure indicator to generate a pressure-indicative signal; and at least one connecting line commencing at said pressure indicator and having a terminal portion situated externally of said housings for furnishing said pressure-indicative signal.

4,488,575

VOLUME FLOW REGULATOR FOR VENTILATION SYSTEMS

Josef Haaz; Wolfgang Finkelstein, both of Neukirchen-Vluyn, and Gregor Baumeister, Krefeld, all of Fed. Rep. of Germany, assignors to Gebr. Trox GmbH, Neukirchen-Vluyn, Fed. Rep. of Germany

Filed Nov. 3, 1982, Ser. No. 438,777

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1981, 3143940

Int. Cl.³ F16K *31/12*

U.S. Cl. 137—499 17 Claims

1. A volume flow regulator for ventilating systems, comprising:

(a) a generally rectangular conduit section of substantially constant non-interrupted cross section;

(b) a shaft pivotally mounted in said conduit section substantially equidistant a parallel two sides of said conduit section;

(c) a regulating part secured to said shaft and pivotal therewith whereby pivoting thereof regulates flow through said conduit section;

(d) said regulating part includes an even wall connected to said shaft having a length substantially spanning the distance between another parallel two sides of said conduit section;

(e) a semicircular section extends from said even wall at opposed ends thereof; and

(f) the area connecting each of said ends with said semicircular section is rounded off for thereby minimizing noise produced by flow through said regulator.

4,488,576

DIRECTIONAL FLOW CONTROL VALVE

Michael Skelly, P.O. Box 2687, Pampa, Tex. 79066

Division of Ser. No. 096,058, Nov. 20, 1979, Pat. No. 4,330,008, which is a continuation-in-part of Ser. No. 929,312, Jul. 31, 1978, Pat. No. 4,219,049. This application Jul. 6, 1981, Ser. No. 281,014

Int. Cl.³ F15B *13/02*

U.S. Cl. 137—625.21 1 Claim

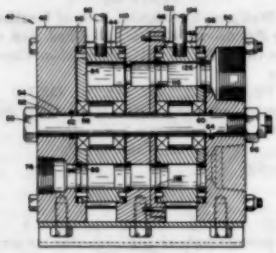
1. A directional control valve comprising:

(a) a first valve body having an inlet port, a mating surface provided on one side thereof and a central longitudinal

axis therethrough perpendicular to said mating surface, said inlet power port being in communication with said mating surface and spaced from said longitudinal axis;

(b) a second valve body having oppositely disposed first and second mating surfaces and being secured to the first valve body for rotation about said longitudinal axis, said first mating surface being engaged with the mating surface of the first valve body, a pair of arcuate recess cavities provided in the first mating surface of the second valve body, each subtending an angle of approximately 180° about the rotational axis of the second valve body, first, second and third spaced passageways longitudinally through the second valve body, each being in communication with one of the recess cavities, third, fourth and fifth spaced passageways longitudinally through the second valve body, each being in communication with the second recess cavity;

(c) a third valve body having a mating surface in contact



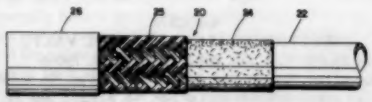
with the second mating surface of the second valve body, first and second working ports provided in the third valve body and an exhaust port provided in the third valve body, each of said ports being in communication with the mating surface thereof, such that in a first position of said second valve body, power fluid from the first valve body flows into the first recess cavity of the second valve body, through the second passageway thereof and to one of the working ports, and exhaust fluid flows into the second recess cavity from the fourth passageway and to the exhaust port of the third valve body through the sixth passageway; and in a second position of said second valve body, power fluid from the first valve body flows into the second recess cavity of the second valve body, through the fifth passageway thereof to the other working port and exhaust fluid flows into the first recess cavity from the third passageway and to the exhaust port of the third valve body through the first passageway.

4,488,577

FIRE RESISTANT HOSE

Isaac U. Shilad, and Lawrence E. Bouscher, both of Manhattan, Kans., assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Sep. 30, 1982, Ser. No. 430,056
Int. Cl.³ F16L *11/04*
U.S. Cl. 138—127 **2 Claims**



1. A hydraulic hose for high temperature environments, comprising

a rubber core tube,

a thermal barrier disposed over said core tube in intimate contact therewith and with no intervening structure, said thermal barrier being formed of fibrous strip material applied generally longitudinally of said hose and fully enveloping said core tube,

a single ply of wire reinforcement disposed over said thermal barrier in tensioned, intimate contact therewith, said wire reinforcement being an open weave on the order of 75 percent coverage and having interstices therein, and

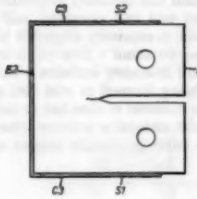
a cover of elastomeric material pressure extruded over said wire reinforcement and through said interstices therein into contact with said thermal barrier and bonded to said thermal barrier, the bond with said thermal barrier being achieved by vulcanization of said hose structure.

4,488,578

PREVENTION OF HYDROGEN EMBRITTLEMENT OF METALS IN CORROSIVE ENVIRONMENTS

Alfred C. C. Tseung; Ho C. Chan; Nani B. Fouzder, and Thurairajah Sriskandarajah, all of London, England, assignors to National Research Development Corporation, London, England

Filed May 21, 1982, Ser. No. 380,936
Claims priority, application United Kingdom, May 26, 1981, 8116018
Int. Cl.³ D03D *49/26*; B05D *3/02*; F16L *9/14*
U.S. Cl. 138—146 **37 Claims**



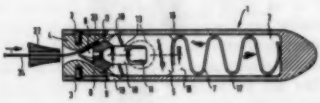
35. A gas or oil pipeline component at least part of the surface of which is provided with a first coating comprising an active substance comprising a metallic sulphide or mixed sulphide containing metallic atoms of at least one metal selected from molybdenum and tungsten and a second, protective, non-conductive and impervious coating over said first coating.

4,488,579

GRIPPER PROJECTILE

Paul Lincke, Zell, Switzerland, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland

Filed Apr. 5, 1983, Ser. No. 482,208
Claims priority, application Switzerland, Apr. 7, 1982, 2144/82
Int. Cl.³ D03J *5/06*
U.S. Cl. 139—196.2 **6 Claims**



1. A gripper projectile for a weaving machine comprising

a body having a hollow interior and at least a pair of discharge orifices communicating with said interior;

a guide nozzle disposed in said interior of said body for receiving an air injected weft yarn and having a passage at one end; and

an axially movable spring-biased clamping member disposed in said body for abutting said nozzle within said passage to

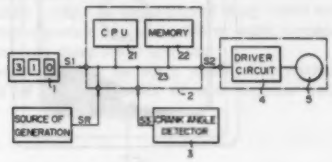
clamp a weft yarn therebetween, said member having an elongated aperture for receiving a projectile opener to disengage said member from said nozzle while placing said passage in alignment with said discharge orifices for immediate discharge of injected air therethrough.

4,488,580

AUTOMATIC METHOD AND APPARATUS FOR STOPPING LOOM ROTATION AT A CONSTANT CRANK ANGLE

Tsutomu Sainen, and Yoshitaka Fujita, both of Ishikawa, Japan, assignors to Tsudakoma Kogyo Kabushiki Kaisha, Japan

Filed Aug. 26, 1982, Ser. No. 411,832
Claims priority, application Japan, Sep. 11, 1981, 56-144126
Int. Cl.³ D03D *51/00, 51/08*
U.S. Cl. 139—336 **6 Claims**



1. Automatic method for stopping loom rotation at a constant crank angle comprising the steps of

forming selected stop angle which represents a stop angle selected depending on a given process condition,

reserving an initial brake lag angle fixed by field observation,

calculating an initial brake start angle by subtraction between the value of said selected stop angle signal and said initial brake lag angle,

detecting constantly current crank angle during said loom rotation to generate a series of current angle signals,

issuing a stop signal for initiating braking action on said loom rotation, every time a stop demand signal is generated, at a moment when the value of said current angle signal becomes equal to said initial brake start angle,

calculating a revised brake lag angle by subtraction between an actual stop angle and said initial brake start angle at stoppage of said loom rotation caused by brake action, and

renewing said initial brake lag angle to said revised brake lag angle.

4,488,581

TERMINAL ALIGNMENT TOOL

Harry M. Stumpf, Hershey, and John A. Woratyla, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

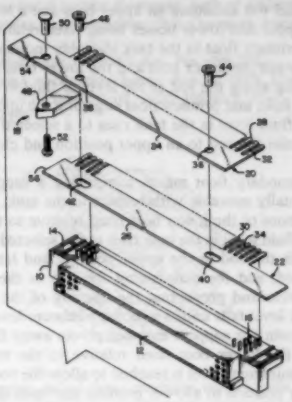
Filed May 19, 1983, Ser. No. 496,045
Int. Cl.³ B21F *1/02*
U.S. Cl. 140—147 **1 Claim**

1. An alignment tool for aligning a plurality of terminals extending from a housing in a high density array of a plurality of parallel spaced rows, said tool comprising:

a pair of rigid comb members, each having a body portion and a plurality of parallel spaced tines extending from one marginal edge thereof, each tine having a profile on one elongated side with the tines of the two members being profiled on opposite elongated sides to define a series of cavities;

means securing said comb members together in superimposed fashion with the tines extending in a common direction, said means allowing limited relative transverse movement of the members whereby in an open condition rows of terminals are received between said tines and in the closed position said tines form entrapment cavities aligning the terminals in their correct respective position; and

a cam actuster rotatably mounted on one of said members and having a cam surface engageable with a cooperating surface on the other of said members whereby relative



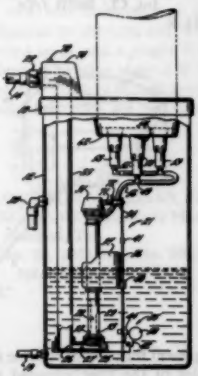
transverse movement of both members occurs by rotating said actuater.

4,488,582

FLUID MIXER ARRANGEMENT

William F. Schilling, Monte Sereno, Calif., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 363,209, Mar. 29, 1982, abandoned, which is a continuation of Ser. No. 154,373, May 20, 1980, abandoned. This application Mar. 16, 1984, Ser. No. 589,849
Int. Cl.³ F16K *31/32*
U.S. Cl. 141—95 **4 Claims**



1. A fluid mixing arrangement comprising:

(a) a tank;

(b) a bottle containing a first fluid;

(c) hydraulically activated means for piercing the bottle allowing the first fluid to flow from the bottle and into the tank;

(d) a ball cock valve in the tank having: an inlet coupled to a source of pressurized second fluid; and, an outlet coupled to the interior of the tank and to the bottle piercing means, said ball cock valve, when open, coupling the second fluid to activate the bottle piercing means and to feed the second fluid into the tank;

(e) means for opening and closing said ball cock valve, said opening and closing means comprising:

a lever having a first end connected to the ball cock valve; and

a rod pivotally connected to a second end of the lever, said rod including an upper boss and a lower boss, the upper and lower bosses being fixed relative to the rod;

(f) a primary float in the tank slideably mounted on the rod between the upper boss and the lower boss for rising and falling along the rod as the level of fluid in the tank rises and falls, said primary float engaging the upper boss when the fluid level in the tank rises to a selected highest level to raise the rod to an upper position and close the valve; and

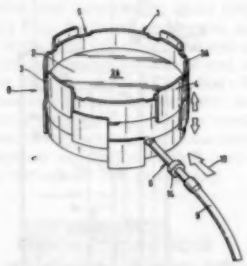
(g) secondary float means comprising a support member, pivotally movable with respect to the tank, for engaging portions of the lower boss fixed relative to the rod when the fluid level in the tank rises to the selected highest level to fix the rod in the upper position and latch the valve closed, and for maintaining the rod in the fixed upper position and preventing the opening of the valve as the fluid level falls until a selected minimum level is reached, and wherein the support member pivots away from the portions of the lower boss fixed relative to the rod when the selected minimum level is reached to allow the rod to fall from the upper position to a lower position and open the valve, said support member engaging portions of the lower boss fixed relative to the rod when said rod falls from the upper position to the lower position.

4,488,583

ARRANGEMENT TO MAKE POSSIBLE THE SUPPLY OF MATERIAL TO RECEPTACLES AND MEANS THEREFORE

Peter L. Larsson, Mölndal, and John-Erik B. Brorson, Västra Frölunda, both of Sweden, assignors to AB Centor SA, Goteborg, Sweden

Filed Feb. 25, 1983, Ser. No. 469,961
Claims priority, application Sweden, Feb. 26, 1982, 8201205
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—311 R **8 Claims**



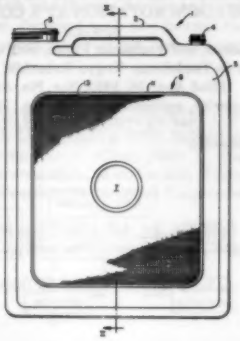
1. In an arrangement for making possible the supply of material to receptacles of the type intended to contain culture material, which receptacles are adapted to be arranged in a pile, one receptacle being placed on top of another receptacle, the improvement comprising a plurality of receptacles, each of which is provided with a bottom surface on which material is deposited, and a wall projecting upwardly from the bottom surface, and a plurality of piling projections extending along the wall of each of said plurality of receptacles in upwards and downwards directions from the bottom surface to a level above the free upper peripheral edge of the wall and to a level below that of the peripheral edge of the bottom surface, respectively, so as to make it possible for said plurality of receptacles to be arranged in a pile, which said projections gripping the edges of upper and lower receptacles of said plurality of piled receptacles, respectively, and said receptacles receiving intended culture material.

4,488,584

DRAINER CONTAINER AND FUNNEL

Borge Hestehave, Alta Loma, and Kjeld Hestehave, Upland, both of Calif., assignors to Bomatic, Inc., Ontario, Calif.

Continuation-in-part of Ser. No. 429,854, Sep. 30, 1982, abandoned. This application Sep. 21, 1983, Ser. No. 534,288
Int. Cl.³ B65B *39/00*
U.S. Cl. 141—339 **19 Claims**



1. A drainer container and funnel comprising:

a container having an elongated internal receiving chamber defined by a pair of opposed major walls and at least one minor wall which interconnects said major walls, wherein a first of said opposed major walls is of a shape for supporting said container and wherein a second of said opposed major walls is provided with an inwardly recessed, funnel receiving, wall portion and an aperture therethrough at an innermost part of said recessed wall portion;

an essentially rigid funnel having a funnel wall portion and a spout portion, said spout portion being constructed for detachably connecting to said recessed wall portion in a manner communicating with said receiving chamber through the aperture therein, and said funnel wall portion being of a size and shape for being substantially entirely received with the recessed wall portion of the container when said spout portion is connected thereto; and

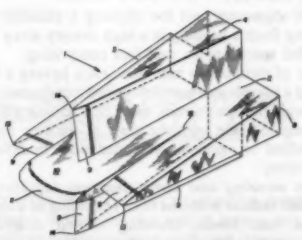
closure means for sealing said aperture when said funnel is detached.

4,488,585

FIREWOOD QUARTERING SPLITTER WEDGE

John F. Kendziorski, 49756 York Rd., Adena, Ohio 43901

Filed May 31, 1983, Ser. No. 499,558
Int. Cl.³ B27L *7/00*
U.S. Cl. 144—193 D **1 Claim**



1. A metal tool for quarter splitting wood logs, billets and the like, of the type having a body cross-shaped in cross section formed by four tapered wedge blades joined at an axially extending central body portion from which each blade projects

outward at right angles to its two adjacent blades, wherein the improvement comprises:

(a) a solid integral metal body having four similarly tapered wedge blades;

(b) said four wedge blades including two coplanar primary wedge blades and two coplanar secondary wedge blades with said secondary wedge blades projecting normally outward from the sides of said coplanar primary blades;

(c) all of said wedge blades having lower sharp ends extending angularly outwardly downwardly from said central axial body portion;

(d) the lower sharp angularly extending ends of said secondary blades having an axial location spaced above the lower sharp angularly extending ends of said primary blades;

(e) a flat starter portion extending axially downward from the angular sharp ends of and in the general plane of the coplanar primary blades;

(f) said starter portion having a curved sharp lower end;

(g) said starter portion having a uniform width terminating at said curved sharp lower end; and

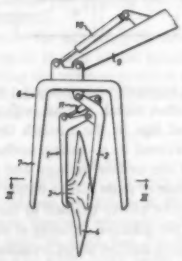
(h) said starter portion having a width of approximately one-half of the total width of said coplanar primary blades.

4,488,586

METHOD AND DEVICE FOR CLEANING STUMPS

Lars Widegren, Kiruna, Sweden, assignor to Elektro Diesel, Sweden

Filed Feb. 15, 1983, Ser. No. 466,643
Claims priority, application Sweden, Feb. 16, 1982, 8200933
Int. Cl.³ B27L *7/00*; B27C *9/00*
U.S. Cl. 144—363 **12 Claims**



1. A method of cleaning a stump from adherent impurities such as soil, stones, litter and the like, comprising providing gripping means, providing impact means associated with said gripping means and movable relative thereto, grasping and retaining said stump with said gripping means, lifting said stump in retention by said gripping means, and colliding one of said stump and said gripping means with said impact means, whereby said impurities are shaken from the stump.

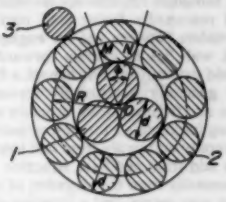
8. Apparatus for cleaning stumps from adherent impurities such as soil, stones, litter and the like, comprising gripping means for grasping and retaining a stump, impact means associated with said gripping means and having at least one impact member positioned adjacent to said gripping means and movable relative thereto, and means for shaking said stump by impact with said impact member, whereby said impurities are shaken from the stump.

4,488,587

PNEUMATIC RADIAL TIRES

Yujiro Umezawa; Yoshio Suzuki, both of Higashimurayama; Teruo Miura, and Kiyohito Kawasaki, both of Akigawa, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed May 25, 1983, Ser. No. 498,218
Claims priority, application Japan, Jun. 4, 1982, 57-83219
Int. Cl.³ B60C *9/08, 9/20*; D02G *3/36*
U.S. Cl. 152—359 **7 Claims**



1. A pneumatic radial tire containing metal cords as a tire reinforcement comprising; a rubberized carcass ply having a metal cord coated with a coating rubber, said metal cord having a layer construction of 3+9+1 with three filaments twisted together to form a core, nine filaments each having the same diameter as in the filament for the core and twisted around the core to form a second layer and a single filament wrapped around the second layer, a twisting angle α of the second layer limited to a range of $72.0° \leqq \alpha \leqq 78.0°$, and wherein the surfaces of the filaments forming said core are not covered with said coating rubber.

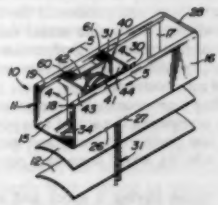
6. A pneumatic radial tire containing metal cords as a tire reinforcement comprising a rubberized belt ply having a metal cord coated with a coating rubber, said metal cord having a layer construction of 3+9+1 with three filaments twisted together to form a core, nine filaments each having the same diameter as in the filament for the core and twisted around the core to form a second layer and a single filament wrapped around the second layer, a twisting angle α of the second layer limited to a range of $72.0° \leqq \alpha \leqq 78.0°$, and wherein surfaces of the filaments forming said core are not covered with said coating rubber.

4,488,588

CORD LOCK FOR VENETIAN BLIND

David K. McClure, Muncy, Pa., assignor to Marathon Manufacturing Company, Houston, Tex.

Filed Jan. 24, 1983, Ser. No. 460,445
Int. Cl.³ E06B *9/38*
U.S. Cl. 160—178 C **6 Claims**



1. In a venetian blind, the combination comprising a headrail channel having a bottom wall with a cut-out, front and back walls upstanding from said bottom wall, and inturned upper lips on said front and back walls and terminating in downwardly facing edges; and, a cord lock structure integrally

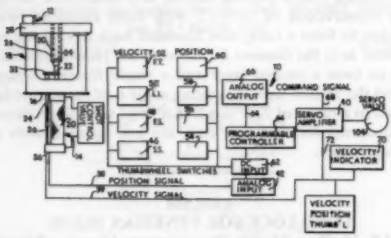
fabricated of plastic and comprising a pair of generally vertical front and back structure walls having lowered edges seated on said channel bottom wall and a pair of spaced generally vertical side structure walls extending between said front and back structure walls and combining therewith to define an opening between said front, back and side structure walls communicating downwardly through said cut-out, upwardly facing front and back shoulders externally on said front and back structure walls beneath and in retaining engagement with the respective inturned lip edges of said front and back channel walls to retain said structure downwardly on said channel bottom wall, said front and back shoulders respectively terminating inwardly in forwardly and rearwardly facing wall portions upstanding above said shoulders between and for engagement with said front and back wall lips to restrain forward and backward movement of said structure in said channel, a fixed guide member extending generally horizontally forwardly and rearwardly between said front and back structure walls and spaced over said opening for guiding a lift cord upwardly through said opening and laterally outwardly from said structure, generally upright slots in said front and back structure walls extending downwardly generally from the elevation of said guide member and defining way means, and a jamming element shiftable up and down in said way means toward and away from cord jamming relation with said guide member, said jamming element having a frictional surface for frictional engagement with a lift cord and elevation thereby into said jamming engagement.

4,488,589

SHOT CYLINDER CONTROLLER

James I. Moore, Zeeland, and Philip J. Van Huis, Holland, both of Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed Dec. 16, 1981, Ser. No. 331,350
Int. Cl.³ B22D *17/32*
U.S. Cl. 164—155 **1 Claim**



1. A shot cylinder controller for regulating the velocity of a hydraulically operated shot cylinder ram of a die-casting machine to maintain a desired pre-set ram velocity profile comprising:

means located externally of the hydraulic supply system for sensing the velocity and position of the shot cylinder ram and for producing a separate actual ram velocity signal and an actual ram position signal; means for pre-setting a ram velocity profile of desired ram velocities for predetermined ram positions;

means including a programmable computer having an input module for comparing the actual ram position signal with the preset ram position velocity and means to produce a command velocity signal from said programmable computer;

spool valve means having a spool and an LVDT signal generator to produce a spool position signal in accordance with spool movement;

pilot valve means having an armature driven spool means conditioned to assume opposite full-on flow positions in accordance with a full step positive or negative valve current drive signal;

control means including means for comparing said actual ram velocity signal with said command velocity signal to produce a ram velocity error signal; first amplifier means conditioned by said error signal to produce an output signal; second amplifier means conditioned by said output signal to produce a current boost stage signal; a current boost stage for producing opposite polarity full step valve current drive signals for selectively positioning said pilot valve means only in a full-on flow position when energized; and means responsive to said spool position signal for producing a signal to suppress said full step valve current drive signals to turn off said current boost stage when velocity errors are compensated;

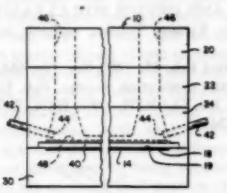
said spool valve means being driven by reverse hydraulic flow from said pilot valve means to produce modulated flow from said spool valve means to the shot cylinder ram without reference to pilot valve null point and without reference to pilot valve hysteresis so as to control velocity of a shot cylinder ram to compensate for shot speed changes produced during operation of the die-casting machine.

4,488,590

APPARATUS FOR STRIP CASTING HAVING A HEATED ORIFICE

Nazmi Y. Toker, Monroeville, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 194,096, Oct. 6, 1980, abandoned. This application Jul. 13, 1982, Ser. No. 397,717
Int. Cl.³ B22D *11/10*
U.S. Cl. 164—423 **3 Claims**



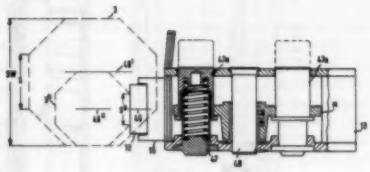
1. A strip casting apparatus comprising a tundish for receiving and holding molten metal, and an orifice passage defined between two spaced lips in the tundish through which the molten metal is delivered to a casting surface located within about 0.120 inch of the orifice passage and movable past the orifice passage at a rate of from 200 to 10,000 linear surface feet per minute, at least one cavity defined in the tundish adjacent at least a portion of the material defining at least one of the lips of the orifice passage, a molten metal resistant plate forming at least one of the lips of the orifice passage, at least one lance disposed through a portion of the tundish with a tip of said lance directed toward said cavity, means for delivering reactive gases through said lance and into said cavity to provide sufficient heat in said cavity to cause heat transfer through the lip to heat at least a portion of said orifice passage, and at least one aperture defined in the tundish in communication with said cavity through which combustion products from the reactive gases escape the cavity in the tundish wherein the improvement comprises:

a heat conductive layer of graphite in the cavity in the tundish on at least a portion of the lip-forming plate of boron nitride at a location where reactive gases from the lance impinge against the plate to protect the tundish material and said plate, said layer being a more resistant material than said plate and able to absorb both thermal and chemical abuse and to transfer heat through the plate to a portion in contact with the molten metal.

4,488,591
CONTINUOUS BILLET GUIDE STAND

Rudolf Hoffmann, Krefeld, and Adolf G. Zajber, Langenfeld, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed Apr. 22, 1982, Ser. No. 370,961
Claims priority, application Fed. Rep. of Germany, May 2, 1981, 3117500
Int. Cl.³ B22D 11/128
U.S. Cl. 164—442 11 Claims



1. A continuous billet guide stand for use in adjoining a secondary cooling section of a conveying and straightening machine in a continuous casting installation for billets of any cross-section, including blooms of relatively large cross-section and variable billet dimensions, said guide stand comprising:

an upper guide frame;

an upper horizontal guide roller mounted in said upper guide frame;

a lower guide frame;

a lower horizontal guide roller mounted in said lower guide frame;

means for vertically adjusting one of said upper and lower rollers to provide a vertically adjustable guide roller;

a pair of lateral support and guide roller structures, each of said support and guide roller structures comprising:

a vertically oriented lateral support and guide roller;

a roller support for mounting the lateral support and guide roller;

a lateral guide frame for guiding said roller support in a horizontal direction;

an adjusting device for adjusting the horizontal position of said roller support in said lateral guide frame; and

means for adjusting the vertical position of said lateral guide frame in response to vertical adjustment of said vertically adjustable guide roller.

4,488,592
OSCILLATING COOLANT PUMP

Faquir C. Mittal, Audubon, and Edwin R. Phillips, Rosemont, all of Pa., assignors to Sperry Corporation, New York, N.Y.

Filed Aug. 24, 1983, Ser. No. 525,859
Int. Cl.³ F28C 3/00; F01B 7/10
U.S. Cl. 165—104.31 7 Claims

5. A system for fluid cooling an electronics package comprising:

a pump housing having first and second voids formed therein, said voids separated by a divider;

first void port means for fluidly connecting only said first void externally of said housing, said first void port being free of check valves;

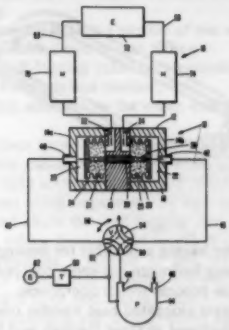
second void port means for fluidly connecting only said second void externally of said housing, said second void port being free of check valves and being separate from said first void port;

a pair of opposed bellows, each one of said bellows defining an expansible chamber in a respective one of said voids;

reciprocable means extending through said divider for moving one of said bellows to an expanded position in response to movement of the other of said bellows to a contracted position;

means operably connected for moving said reciprocable means;

first bellows port means extending through said divider for fluidly connecting only one of said expansible chambers externally of said housing, said first bellows port being free of check valves and being separate from said void ports; and

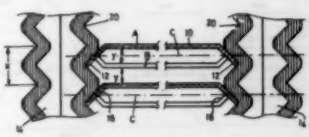


second bellows port means extending through said divider for fluidly connecting only the other of said expansible chambers externally of said housing, said second bellows port being free of check valves and being separate from said void ports and said first bellows port.

4,488,593
HEAT EXCHANGER

Desmond Mulock-Bentley, Illovo, South Africa, assignor to D. Mulock-Bentley and Associates (Proprietary) Limited, South Africa

Filed Sep. 10, 1982, Ser. No. 416,471
Int. Cl.³ F28D 1/04
U.S. Cl. 165—151 4 Claims



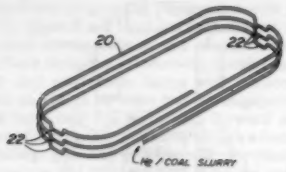
1. A heat exchanger which comprises spaced apart elongate conduits, each pair of opposed conduit surfaces carrying registering rows of grooves, and elongate fin elements locatable in the grooves by lengthwise sliding of the fin elements between the conduits, each fin element being formed from a single strip of metal to have a longitudinally extending central zone and two longitudinally extending edge zones and a plurality of fins which are spaced along the length of the fin element, which fins lie alternately in two parallel planes to form first and second fin sets, which extend across the central zone and which each have a planar bridge portion at either end, the longitudinal edge zones of the fin elements being inclined at an obtuse included angle with respect to the central zone and being coplanar with, and adjoining, the bridge portions of the first set of fins, the bridge portions of the two fin sets being orientated at an angle with respct to one another, and the grooves carried by the conduits being so deep relatively to the fin elements that not only the longitudinal edge zones, but also the bridge portions of the first set of fins, are in contact with the surfaces of the grooves.

4,488,594

FIRED HEATER FOR COAL LIQUEFACTION PROCESS

David H. S. Ying, Macungie, Pa., assignor to International Coal Refining Company, Allentown, Pa.

Filed Oct. 19, 1983, Ser. No. 543,638
Int. Cl.³ F28D 7/02
U.S. Cl. 165—163 8 Claims



1. A fired heater having a chamber for heating a multi-phase mixture comprising hydrogen gas and a coal/solvent slurry in a coal liquefaction process which comprises:

(a) an imperforate elongated heat transfer tube for the flow of said multi-phased mixture through said heater;

(b) said transfer tube being constructed and arranged to pass through said chamber of said fired heater in a substantially horizontal path moving vertically up through said heat transfer chamber, wherein said heat transfer tube has U-bends along the length of said tube;

(c) said U-bends being constructed and arranged to provide a flow path through said U-bend portion of said tube wherein said mixture flows downward for a length of said U-bend in said tube and then upward for a length of said U-bend in said tube to resume flow through said elongated substantially horizontal flow path moving vertically up through said chamber;

(d) said U-bends being situated in said tube at intervals less than 200 times the ratio of the length to the diameter of said tube to increase the slug frequency, dispersion of said mixture and to thereby increase the heat transfer efficiency of said transfer tube.

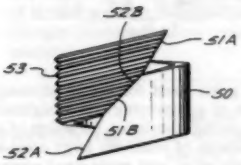
4,488,595

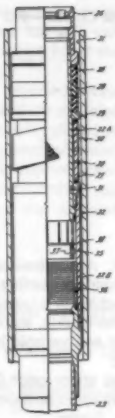
WELL TOOL HAVING A SLIP ASSEMBLY

Neil H. Akkerman, 15106 Beacham, Houston, Tex. 77070, assignor to Neil H. Akkerman, Houston, Tex.

Filed Jun. 23, 1983, Ser. No. 507,075
Int. Cl.³ E21B 23/02
U.S. Cl. 166—206 26 Claims

1. A tool adapted to grippingly engage a cylindrical surface within a well conduit, comprising a body adapted to be lowered into the well conduit, and a slip assembly including a sleeve having a relatively high friction cylindrical surface on one side thereof and carried by the body for lowering therewith so that the high friction surface may be disposed opposite the cylindrical surface within the well bore, said sleeve having one end which may be moved in one axial direction with respect to its other end, and means on said ends which force the sleeve to move from one to the other of circumferentially expanded and contracted positions, and thereby urge the cylindrical surface thereof into gripping engagement with the cylindrical surface of the well conduit, as said one end is moved in said one axial direction with respect to said other end, and said body having means which is operable, when the high friction surface is so disposed, to cause said one end of the sleeve to move in said one axial direction with respect to the other end.





4,488,596

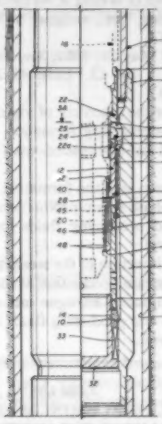
LOCKING APPARATUS FOR USE IN A SUBTERRANEAN WELL

Neil H. Akkerman, Kingwood, Tex., assignor to Baker International Corporation, Orange, Calif.

Continuation of Ser. No. 259,765, May 1, 1981,. This application Oct. 26, 1983, Ser. No. 545,354
Int. Cl.³ E21B 23/00
U.S. Cl. 166—217 8 Claims

3. An apparatus for locking a tool carrying mandrel in an annular groove formed on the interior surface of a subterranean well conduit, comprising: a segmented ring mounted on said mandrel including a plurality of circumferentially spaced segments; and means having tapered surfaces in constant physi-

cal contact with and axially shiftable between the ends of said segments for wedging said segments apart, whereby the circumference of said segmented ring may be increased to engage the locking groove.

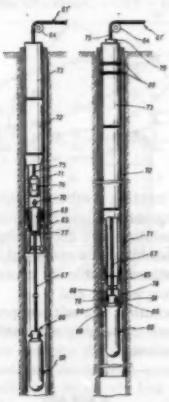


4,488,597

PUMP-DOWN STINGER ASSEMBLY METHOD AND APPARATUS

Joachim A. Hoppe, Spring, and Ralph L. Simmons, Pearland, both of Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Oct. 13, 1981, Ser. No. 310,830
Int. Cl.³ E21B *47/00*
U.S. Cl. 166—250 **40 Claims**



1. A pump-down stinger assembly method for use with a well-logging tool suspended from a well-logging cable in a borehole, comprising:

lowering the well-logging tool and well-logging cable through a length of drill pipe disposed in the borehole;

terminating the well-logging cable proximate the upper end of the borehole to provide a first length of well-logging cable;

releasably attaching the first length of well-logging cable to a lower end of a length of stinger;

lowering the length of stinger into said drill pipe;

retrieving the first length of well-logging cable attached to the lower end of the stinger;

raising the first length of well-logging cable through said stinger until the upper end of the first length of well-logging cable is disposed proximate the upper end of the borehole; and

securing the upper end of the first length of well-logging cable to a second length of well-logging cable.

33. A stinger adapter assembly for use with a length of stinger and a well-logging tool in a borehole, comprising:

a length of tubing having first and second ends;

means for attaching the length of stinger to said first end of the tubing;

means for securing at least a portion of the well-logging tool within the second end of said tubing;

a length of well-logging cable for suspending the well-logging tool from one end thereof;

retainer means attached to the other end of said length of cable;

a seating surface formed on the inner surface of said tubing intermediate said first and second ends, said surface defining an opening allowing said length of cable to pass therethrough and being engageable by said retainer means to retain it and allow the well-logging tool to be suspended from said tubing through said length of cable;

means for retaining a portion of said well-logging cable within said tubing thus allowing the well-logging tool to be suspended from said tubing cable;

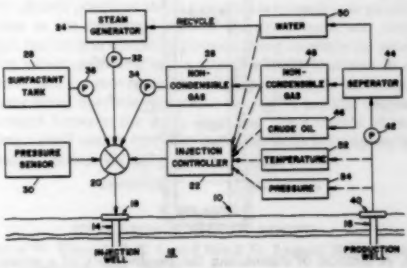
means for positioning the tubing above the borehole, said positioning means being disposed on the outer surface of said tubing.

4,488,598

STEAM, NONCONDENSABLE GAS AND FOAM FOR STEAM AND DISTILLATION DRIVE IN SUBSURFACE PETROLEUM PRODUCTION

John H. Duerksen, Fullerton, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 18, 1983, Ser. No. 476,642
Int. Cl.³ E21B *43/24, 47/06*
U.S. Cl. 166—252 **3 Claims**



1. A method of recovering petroleum from a subterranean, petroleum containing, permeable formation, said formation being penetrated by at least one injection well and by at least one production well, comprising the steps of:

(a) injecting steam into said formation through said injection well, said steam being injected at high temperature, high pressure and high volume to rapidly initiate and maintain steam distillation of petroleum within said formation;

(b) distilling said petroleum in the form of a distillate bank ahead of said steam within said formation;

(c) monitoring at said production well temperature and pressure conditions of reservoir materials as well as fluid production into said production well related to said injection into said injection well;

(d) initiating injection of a noncondensable gas into said formation through said injection well where said steam distillation of said petroleum has been initiated and maintained;

(e) injecting with said steam and noncondensable gas a foamable surfactant capable of producing a foam at formation temperatures and pressures to flow into said formation and reduce steam and gas breakthrough at said production well; and

(f) based on the monitoring of production well conditions, maximizing said distillate bank by manipulating the temperature, pressure and volume of reservoir materials.

4,488,599

METHOD OF CONTROLLING DISPLACEMENT OF PROPPING AGENT IN FRACTURING TREATMENTS

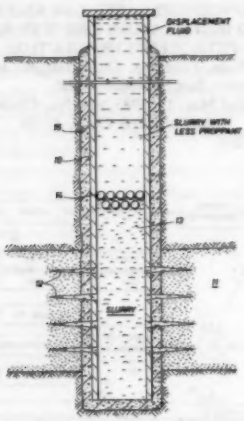
Robert L. Graham, Baytown, and Steven R. Erbstoesser, Missouri City, both of Tex., assignors to Exxon Production Research Co., Houston, Tex.

Continuation-in-part of Ser. No. 412,671, Aug. 30, 1982, Pat. No. 4,421,167, which is a continuation of Ser. No. 204,103, Nov. 5, 1980, abandoned. This application Jul. 22, 1983, Ser. No. 516,074

The portion of the term of this patent subsequent to Dec. 20, 2000, has been disclaimed.

Int. Cl.³ E21B *33/13, 43/267, 47/06*

U.S. Cl. 166—255 **8 Claims**



1. A method of stimulating the productivity of a subterranean formation surrounding a casing having perforations formed therein, the method comprising the steps of:

injecting into said formation through the perforations a slurry of fracturing fluid and propping agent particles at a pressure and rate sufficient to generate a fracture in said formation;

incorporating ball sealers into a trailing end portion of said slurry, said ball sealers having a density such that the ball sealers do not settle in the slurry; and

pumping a fluid down the well to displace the trailing end portion of said slurry from the surface to the perforations, said displacing fluid having a density such that the ball sealers do not rise in the displacing fluid;

monitoring the resistance to pumping of said displacing fluid; and,

terminating the pumping of said displacing fluid in response to detection of an increase in the resistance to pumping of said displacing fluid indicative of seating of at least some of the ball sealers on the perforations.

4,488,600

RECOVERY OF HEAVY OIL BY STEAM FLOODING COMBINED WITH A NITROGEN DRIVE

Mark J. Fan, Irving, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 24, 1982, Ser. No. 381,236

Int. Cl.³ E21B *43/24*

U.S. Cl. 166—263 **2 Claims**

1. A method for the recovery of viscous oil from a subterranean, viscous oil-containing formation penetrated by at least one injection well and one spaced-apart production well, comprising:

(a) injecting steam into the formation via said injection well until vapor phase steam production occurs at the production well and producing fluids including oil from said production well;

(b) terminating injection of the steam upon the occurrence of vapor phase steam production at the production well; and

(c) thereafter injecting nitrogen into the formation via said injecton well and producing fluids including oil from said production well.

4,488,601

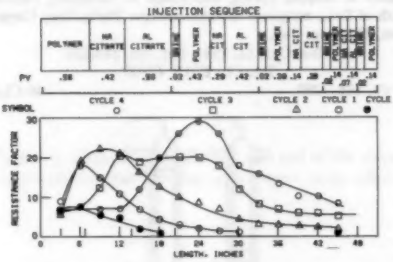
CONTROL OF ALUMINUM CROSS-LINKED POLYACRYLAMIDES FOR SWEEP IMPROVEMENT

Robert E. Hammett, Tulsa, Okla., assignor to The Standard Oil Company, Chicago, Ill.

Filed Sep. 29, 1982, Ser. No. 426,303

Int. Cl.³ E21B *43/22, 33/138*

U.S. Cl. 166—270 **9 Claims**



1. A method of treating a subterranean formation, comprising the steps of sequentially injecting into the formation:

(a) an aqueous solution of a cross-linkable polymer;

(b) an aqueous solution of a cross-linking agent comprising multivalent cations suitable for cross-linking the polymer and sequestering anions; and

(c) an aqueous solution of a salt comprising cations selected from the group consisting of alkali metal cations and sequestering anions.

4,488,602

PROCESS FOR EMULSION FLOODING OF PETROLEUM RESERVOIRS

Uwe Lepper, Lachendorf, Fed. Rep. of Germany, assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 16, 1983, Ser. No. 495,204

Claims priority, application Fed. Rep. of Germany, May 14, 1982, 3218346

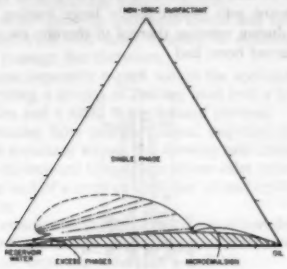
Int. Cl.³ E21B *43/22*

U.S. Cl. 166—274 **13 Claims**

1. Process for the recovery of petroleum from a reservoir having at least one injection well and at least one recovery well comprising:

(a) introducing into said reservoir through said injection well a thermodynamically stable microemulsion consisting essentially of oil, water and a non-ionic surfactant;

(b) injecting an aqueous driving fluid into said reservoir through said injection well, to drive said microemulsion and petroleum towards the recovery well, said aqueous driving fluid contacting said emulsion to form an excess



phase having a high water content, low oil content, a low surfactant content and a viscosity sufficient to prevent penetration of said driving fluid into the microemulsion; and

(c) recovering displaced petroleum from said recovery well.

4,488,603

A COMPACT AND HIGHLY MOBILE FIRE-FIGHTING VEHICLE

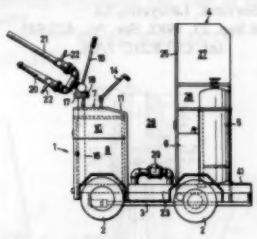
Hans-Bernd Schmittmann, Velbert, Fed. Rep. of Germany, and Samuel Müller, Wetzikon, Switzerland, assignors to Dr. H. Schmittmann GmbH, Fed. Rep. of Germany

Filed Mar. 27, 1978, Ser. No. 890,807

Claims priority, application Switzerland, Mar. 28, 1977, 3914/77; Fed. Rep. of Germany, Jul. 21, 1977, 2732886

Int. Cl.³ A62C *27/16*

U.S. Cl. 169—24 **19 Claims**



1. A fire-fighting vehicle having a small and compact construction which allows passage through a standard building door opening, hall corridors, or the like, comprising:

a movable chassis which is relatively low and is supported by a plurality of wheels for transporting said vehicle; means carried by said chassis for independently fighting a variety of fires without attachment to an external source of water;

means for self-propulsion supported by said chassis, said self-propulsion means including an electric motor operatively connected to at least one of said wheels, battery means electrically connected to said electric motor;

a front and rear superstructure arranged on said chassis and a connecting platform therebetween for carrying an operator;

said front superstructure including spray means for spraying fire extinguishing material;

said rear superstructure carrying tank means for storing fire extinguishing materials;

steering means operatively connected with said wheels for directing said vehicle to a fire-fighting location;

connection means for indirectly or directly introducing an external supply of water to said vehicle; and

front and rear wheels supporting said chassis;

said front and rear superstructures supported over said front and rear wheels respectively;

wherein said platform means terminates at an upstanding back support, said back support constituting one wall of a storage compartment for recovery equipment, a concentrate tank located below said storage compartment and in at least close proximity to said tank means which contains foam or powder extinguishing material.

4,488,604

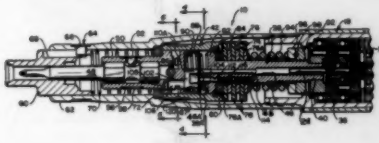
TORQUE CONTROL CLUTCH FOR A POWER TOOL

Hugh L. Whitehouse, Lyndhurst, Ohio, assignor to The Stanley Works, New Britian, Conn.

Filed Jul. 12, 1982, Ser. No. 397,472

Int. Cl.³ B23Q *5/00*; F16D *43/22*

U.S. Cl. 173—12 **18 Claims**



1. A power tool comprising a fluid operated motor and rotary drive input drivingly connected to the motor, a rotary drive output rotatable about an axis coincident with that of the rotary drive input, clutch means normally establishing a releasable unitary drive connection between the drive input and drive output and providing relative angular slipping movement therebetween at a predetermined output torque, a power drive control unit including a latch movable between operating and power shutoff positions about a pivot axis extending in parallel relation to the rotational axes of the drive input and drive output, the latch in operating position being operable for establishing motor operation, and a rotary actuator movable in an angular path of movement containing the latch, the rotary actuator being operable responsive to relative angular slipping movement between the drive input and drive output at said predetermined output torque to move the latch from operating position to power shutoff position.

4,488,605

EXTENDIBLE SHANK AUGER

Richard W. Ruppel, R.R. 4, and Mark G. Ruppel, R.R. 1, both of Cumberland, Wis. 54829

Filed Apr. 29, 1982, Ser. No. 372,963

Int. Cl.³ E21B *17/07*; F25C *5/04*

U.S. Cl. 175—18 **10 Claims**

1. A drill assembly for forming a hole, comprising:

a shank assembly having an upper longitudinal shank member and a lower longitudinal shank member, said lower shank member being tubular and said upper shank member having a portion telescopically engaged and axially rotatable in the lower shank member and telescopically movable therein between a first relatively retracted position with a substantial length of the upper shank member retracted into the lower shank member and a second relatively extended position of the shank assembly with a substantial length of the upper shank member outwardly extended from the lower shank member, said telescopic movement between the first and second positions being in excess of twenty-five percent of the length of one of the shank members;

cutting means located on the lower end of the lower shank

member adapted to form a hole in a surface upon rotation in a first axial direction of rotation of the shank assembly;

operating means disposed at the upper end of the upper shank member for axial rotation of the shank assembly in said first direction;

releasable coupling means to couple the upper and lower shank members selectively in the first and second positions whereby rotation of the upper shank member in the first direction results in rotation of the lower shank member to form a hole, said coupling including an elongate longitudinal groove formed in the upper shank member having parallel uninterrupted side walls extending approximately midway on the upper shank member to a location proximate one end thereof, a first circumferential slot on the upper shank member extending from the upper end of the groove in perpendicular relationship to the groove in direction opposite to the first direction of rotation, a second circumferential slot on the upper shank member ex-

tending from the lower end of the groove in parallel relationship to the first slot, and a bearing pin fixed to the lower shank member and having an inwardly extended end locatable in said groove for relative telescopic movement between the upper and lower shank members, each slot having uninterrupted parallel side walls whereby the bearing pin is seated and unseated with respect to a slot by axial rotation of the upper shank member with respect to the lower shank member, said bearing pin being locatable in the first slot for coupling the upper and lower shank members in the first position, and locatable in the second slot for coupling the upper and lower shank members in the second position by axially rotating the upper shank member in a direction opposite the first direction of rotation to unseat the bearing pin from the first slot and permit the lower shank member to move to the second position whereby the bearing pin is seated in the second slot upon further rotation of the upper shank member in the first direction of rotation.

4,488,606

METHOD OF EXCAVATING AN UNDER-REAMED PILE BORE

Hachiro Inoue, 13-10, Kokubu 4-chome, Ichikawa-shi, Chiba-ken, Japan

Continuation of Ser. No. 257,906, Apr. 27, 1981, Pat. No. 4,396,026. This application Apr. 1, 1983, Ser. No. 481,152

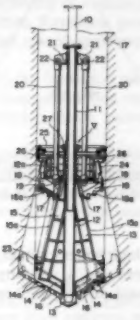
Int. Cl.³ E21B *10/32, 10/30*

U.S. Cl. 175—57 **3 Claims**

1. A method of excavating an under-reamed pile bore, comprising the steps of:

(a) excavating a straight pile bore to a given depth by rotating a main drill bit in a first direction while applying downward thrust to said main drill bit;

(b) excavating an under-reamed pile bore by rotating a plurality of slidable wing bits in a direction opposite the first direction so that said slidable bits move both downward and outward into progressively large cutting diameter position during rotation thereof to thereby excavate said under-reamed bore; and



(c) stabilizing soil walls of said under-reamed pile bore by means of a stabilizer slidably disposed above said wing bits to progressively contact said under-reamed bore walls following formation thereof by cutting action of the wing bits to thereby produce soil walls having stable impermeable surfaces.

4,488,607

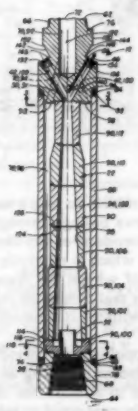
SEPARATOR SUB WITH ANNULAR FLOW PASSAGE

Asadollah Hayatdavoudi, Lafayette, La., and Ladd M. Adams, Norman, Okla., assignors to Petroleum Instrumentation & Technological Services, Lafayette, La.

Filed Sep. 27, 1982, Ser. No. 423,515

Int. Cl.³ E21C *7/08*

U.S. Cl. 175—65 **15 Claims**



1. An apparatus for use in the drilling of a well with a drill bit supported by an elongated drill string having a bore through which a stream of drilling mud circulates to remove cuttings of the drill bit, comprising:

a. an upper adapter means for connecting said apparatus to a drill string;

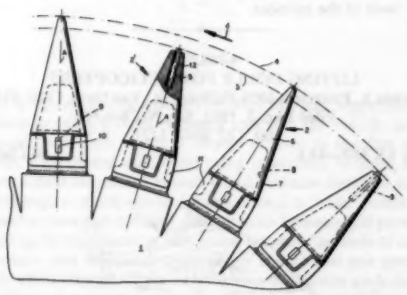
b. a lower adapter means for connecting said apparatus to a drill bit;
c. a tubular outer housing having an upper end connected to said upper adapter means and having a lower end connected to said lower adapter means;
d. a cyclone housing, disposed within and spaced radially inward from said outer housing to defining an annular flow passage therebetween;
e. cyclone separator means within the cyclone housing for separating a stream of drilling mud into a less dense first portion and a more dense second portion;
f. an annular flow passage means, disposed about said cyclone separator means, for flowing said stream of drilling mud downward toward a cyclone inlet means adjacent a lower end of a cyclone chamber of said cyclone separator means;
g. first conduit means for directing said less dense first portion of said stream of drilling mud downward from said cyclone separator means to a drill bit;
h. second conduit means for directing said more dense second portion of said stream of drilling mud into a well annulus above said drill bit with an upward component of velocity and for thereby reducing hydrostatic drilling mud pressure adjacent said drill pipe; and
i. said upper adapter means has a central bore therein arranged to be communicated with an inner bore of said drill string, and has a plurality of intermediate passageways disposed therein communicating said central bore with an upper end of said annular flow passage means, said intermediate passageways being circumferentially spaced around said central bore.

4,488,608

ROTARY STONE-CUTTING HEAD WITH HARDENED TEETH INSERTS

Rütger Berchem, Gelsenkirchen, Fed. Rep. of Germany, assignor to Berchem & Schaberg GmbH, Gelsenkirchen, Fed. Rep. of Germany

Filed Aug. 31, 1982, Ser. No. 413,233
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1981, 3136077
Int. Cl.³ E21B *10/52*
U.S. Cl. 175—374 **6 Claims**



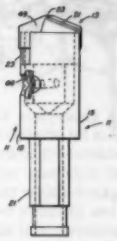
1. A rotary stone-cutting head comprising:
a body generally centered on and adapted to be rotated in a predetermined direction about a body axis;
an array of cutter supports on the body angularly spaced about the body axis;
respective outer cutter teeth carried on some of the supports and having relative to the body axis respective outer cutting edges generally radially equispaced from the body axis and defining on rotation of the body about the body axis an outer orbit centered on the body axis;
respective inner cutting teeth carried on the rest of the supports and alternating with the outer cutting teeth, the inner and outer teeth being radially outwardly tapered and centered on respective teeth axes extending generally radially of the body axis; and
respective hardened-metal insert rods mounted only on the inner teeth centered on the respective teeth axes and having relative to the body axis respective outer ends generally radially equispaced from the body axis and defining on rotation of the body about the body axis and inner orbit radially within and coaxial with the outer orbit, the insert rods being substantially harder than the cutting edges of the outer teeth, the outer teeth being free of such rods.

4,488,609

MINING DRILL

Vinod K. Sarin, Lexington, Mass., assignor to GTE Laboratories, Inc., Waltham, Mass.

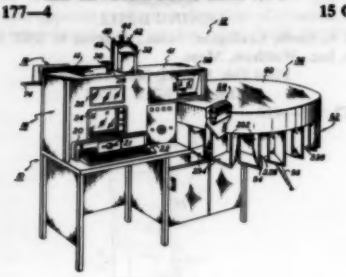
Filed Feb. 8, 1982, Ser. No. 346,973
Int. Cl.³ E21B *10/62*
U.S. Cl. 175—410 **1 Claim**

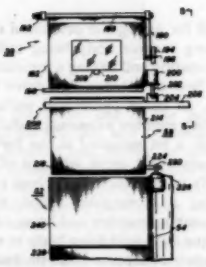


1. A mine drill for aiding the collection of detritus during drilling comprising a drive body being cylindrically shaped about an axis of rotation and having a forward end and an axial passage for the flow of detritus, said drive body including a seating member, an outer cylindrical surface and an inner surface, said seating member extending radially inwardly from said inner surface, a bit mounted at the forward end of said drive body for movement about said axis of rotation, said bit comprising a body portion including a base portion, a depending shank having a rectangular shape, said shank being mounted in said seating member and being adapted to support and transmit torque from said drive body to said bit, said body portion having a pair of support lands projecting forwardly in the axial direction, said bit includes an elongated insert mounted intermediate said support lands, said insert having forwardly projecting cutting edges, a base surface, and side surfaces normal to said base surface extending toward said cutting edges, said base surface lying in a plane substantially normal to the axis of rotating and being secured to said base portion, each support land being offset said axis of rotation and secured to respective opposite sides of said insert whereby during rotation of said bit leading side surfaces are substantially unobstructed and trailing insert surfaces are mounted to respective support lands, said insert having end portions extending in a radial direction outwardly of said base portion and said drive body, said inner surface having a radius of curvature and being substantially concentric with said cylindrical shape, each of said support lands having a maximum dimension as measured from and in a direction perpendicular to a respective side surface of less than about ten percent of said radius of curvature, said drive body having a pair of flanges projecting forwardly in an axial direction, each of said flanges being an extension of said drive body and being formed by said inner surface and said outer cylindrical surface, each of said flanges having a forward end, said forward end being forwardly close to the most rearward portion of said cutting edges, said flanges and said support lands forming a pair of passages adapted for

the conveyance of detritus to said axial passage, each passage being on an opposite side of said bit.

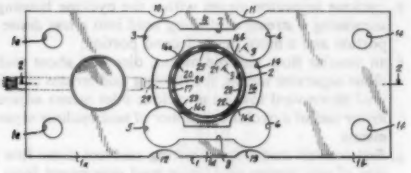
4,488,610
SORTING APPARATUS
Richard A. Yankloski, Webster, N.Y., assignor to Data-Pac Mailing Systems Corp., Rochester, N.Y.
Filed May 17, 1982, Ser. No. 378,653
Int. Cl.³ G01G 23/38; B07C 5/00
U.S. Cl. 177—4 15 Claims





4. Mail sorting apparatus which comprises a plurality of collection bins each for a different category of mail item, said collection bins being spaced from each other along a closed path, a plurality of sorting bins moveable along said path, said sorting bins being disposed vertically above said collection bins, means for feeding said mail items separately into successive ones of said sorting bins, each of said sorting bins carrying an individual item of mail which can be of random category in successive ones of said sorting bins, means operative upon movement of each of said sorting bins into vertical alignment with the ones of said collection bins for the category of mail items therein for enabling said items to drop into said collection bins thereby to sort said mail items by category in said collection bins, a loading station past which said sorting bins move, a printing postage meter, said feeding means also including means for feeding said mail items successively into and out of printing relationship with said meter to present mail items for printing of postage indicia thereon, means responsive to at least one dimension of each of said mail items for moving said mail items and postage meter in a direction along a verticla edge of said items with respect to each other to locate said postage indicia on said mail items.

4,488,611
LOAD CELL
Walter E. Jacobson, Meriden, Conn., assignor to Revere Corporation of America, Wallingford, Conn.
Filed Aug. 23, 1982, Ser. No. 410,703
Int. Cl.³ G01G 3/14, 3/08; G01L 5/12
U.S. Cl. 177—211 11 Claims



1. A load cell, comprising:
a. an elongated beam (1) adapted to be supported at one end (1*a*) and adapted to support a load at its opposite end (1*b*);
b. said beam having:
1. a relatively large cylindrical hole (2) extending horizontally through the beam from side to side at a locality between said ends;
2. four smaller cylindrical holes (3,4,5,6) extending through the beam and spaced radially from the large hole;
3. two slots (7,8) extending horizontally through the beam and respectively connecting upper and lower pairs of said smaller holes, said pairs of smaller holes and their connecting slots being separated from the outer surfaces of the beam by bridging portions (1*c*,1*d*) of the beam; and
4. at least one annular recess (14 or 15) in a side face of the beam, said recess being concentric with the large hole and intersecting all the smaller holes;
c. said large hole, said smaller holes, said slots and said recess cooperating to define a cylinder (17) connected to the ends of the beam by a web (16) at the bottom of said recess, said bridging portions, said cylinder and said web cooperating to define four force transmitting means extending between the ends of the beam; and
d. at least one strain gage (20,21,22,23) attached to an inner wall of the cylinder.

4,488,612
LIFTING DOLLY FOR HELICOPTERS
Thomas A. Patterson, 6959 Halbernt St., Van Nuys, Calif. 91405
Filed Dec. 3, 1982, Ser. No. 446,654
Int. Cl.³ B64F 1/22
U.S. Cl. 180—14.1 20 Claims

1. A lifting dolly for lifting and transporting a helicopter or the like supported on the ground by a spaced pair of generally parallel skids, comprising:
a generally horizontally oriented central frame having a width less than the spacing between the skids, a length generallv less than the lengths of the skids, and a plurality of rollers mounted at the underside thereof;

a plurality of wheels coupled to said frame;

means for adjusting the elevation of said frame relative to said wheels between a first position with said frame elevated above the ground and said wheels in rolling contact with the ground and a second position with said rollers resting on the ground;

a plurality of lifting arms coupled generally to opposite sides of said frame and movable between retracted and laterally outwardly extended positions relative to said frame, each of said lifting arms carrying a lifting finger positioned generally on the ground when said frame is in said second position for pressing beneath an associated one of the skids; and

means for moving said lifting arms in unison toward said extended positions when said frame is located between the skids and disposed in said second position to press said lifting fingers beneath the skids, said rollers accommodating lateral shifting of said frame toward a centered position between the skids as said lifting fingers press beneath the skids, said frame elevation adjusting means being thereupon operable to move said frame to said first position thereby lifting the helicopter off the ground.

4,488,613

FLUID SUSPENSIONS

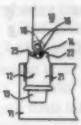
Robert H. Marjoram, Wyken, England, assignor to Dunlop Limited, London, England

Filed Oct. 27, 1982, Ser. No. 436,933

Claims priority, application United Kingdom, Nov. 10, 1981, 8133899

Int. Cl.³ B62D *23/00*

U.S. Cl. 180—89.15 **11 Claims**



1. A vehicle having a chassis or other first part supported by wheels or other ground engaging means of the vehicle and a second, body part which is tiltable relative to the first part about a horizontal axis, there being interposed between said parts a fluid suspension system which includes displacer units in the region of said axis which in a normal or "ride" condition of said second part transmit vertical loads between said parts to a spring by reciprocative movement between elements of each displacer unit connected respectively to said first and second part, characterized by the combination of features such that:

(a) one element of each said unit has a laterally extending pin and there is associated with the other element of said unit a vertically open ended recess arranged to receive the pin in a limit stop position wherein when said one element is retracted into the other element so that said unit ceases to be responsive to the spring, the recesses serve as bearings for the pins when said second part is subsequently tilted, and

(b) means for tilting the second part, said tilting means being positioned to exert a force on the second part so that at no time during the tilting movement of the second part does it exert a force capable of displacing the pins out of the recesses.

4,488,614

AIR-CUSHION VEHICLES

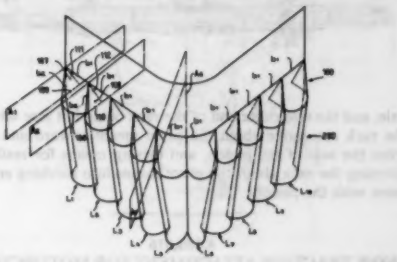
André Lafont, Paris; Michel Rabier, Versailles; Michel Guedon, Rambouillet, and Guy Herrouin, Paris, all of France, assignors to Societe D'Etudes et de Developpement des Aeroglisseurs Marins, Terrestres et Amphibies (SEDAM), Paris, France

Filed Aug. 11, 1982, Ser. No. 407,264

Claims priority, application France, Aug. 12, 1981, 81 15594

Int. Cl.³ B60V *1/04*

U.S. Cl. 180—127 **7 Claims**



1. An air-cushion vehicle comprising a lifted structure, a central lift cushion and a peripheral lift arrangement comprising a plurality of cells defined on the outside by an outer multilobular skirt, each lobe of the outer skirt being constituted by the assembly of an upper part which diverges in a downwards direction with respect to the structure and of a lower part of revolution which converges in a downwards direction with respect to the structure, so that the entire lobe projects outside the structure, the upper part of the lobes being formed by a central member of substantially coplanar and triangular contour, the base of the central member defining the apex of the upper part and being connected to the lifted structure along a horizontal rectilinear line and whereof the apex of the central member being situated in the plane of connection of the two parts, namely the upper part and lower part as well as of two conical envelope members connected to the central member respectively on either side of the latter and connected to the lifted structure along two rectilinear segments disposed in vertical planes, the apices of the conical envelope members being situated on either side of the base of the central member, whereas the bases of the conical envelope members are connected to the lower part in the plane of connection which intersects the lifted structure and constitutes a plane bisecting the angle formed by the outermost generatrices of the upper part and of the lower part.

4,488,615

RACK AND PINION STEERING GEAR AND VEHICLE FITTED WITH SAME

Barry J. Millard, Reading, England, assignor to Adwest Engineering Ltd., Reading, England

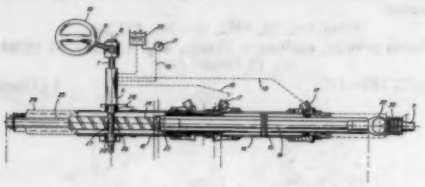
Filed Sep. 24, 1982, Ser. No. 422,857

Int. Cl.³ B62D *5/06*

U.S. Cl. 180—148 **2 Claims**

1. A vehicle having a front end and rear end that includes a pair of steerable road wheels mounted upon a front axle that extends laterally of the vehicle, a track rod mounted parallel with the axle to one side thereof for connecting the steerable wheels for movement together, a single ended power assisted rack and pinion steering gear comprising a housing cylinder that is mounted parallel with the axle on the side opposite the track rod, double acting piston means reciprocable within the cylinder that includes a piston rod, a pinion affixed to the steering column, a toothed rack in meshing engagement with the pinion, valve means also connected to the steering column for directing fluid under pressure from a source to one side or

the other of the piston means, one end of said piston rod being connected to a wheel lever operatively associated with a steerable wheel and the opposite end of the piston rod being pivotably connected by a pivot means to one end of the toothed rack so that the rack and piston rod move together parallel to the



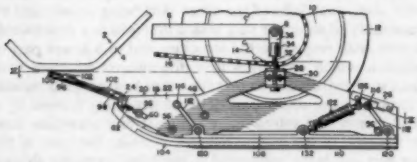
axle, and the said other end of the rack being left free whereby the rack can move about the pivot means toward and away from the axis of the pinion, and biasing means for resiliently pivoting the rack about the pivot means into meshing engagement with the pinion.

4,488,616

SNOW TRACTION ATTACHMENT FOR MOTORCYCLES

Walter L. Harris, 9736 Reeder, Overland Park, Kans. 66214

Filed Jan. 17, 1983, Ser. No. 458,256
Int. Cl.³ B62M *27/02*
U.S. Cl. 180—185 **11 Claims**



1. For use in connection with a vehicle having a powered ground-engaging wheel equipped with a rubber tire, a snow traction attachment comprising:

a. an attachment frame,

b. an endless flexible traction belt carried on suitable belt pulleys rotatably mounted in said frame to form a generally horizontal loop,

c. a pair of drive rollers carried rotatably in said frame and having driving engagement with said belt,

d. means operable to attach said frame to the frame of said vehicle whereby said drive rollers and said belt are disposed beneath said vehicle wheel with the lower reach of said belt positioned to engage a snow surface beneath said wheel and extending forwardly and rearwardly in the direction of vehicle travel, and with said wheel having driving engagement with said drive rollers but not with the upper reach of said belt, whereby said vehicle wheel, acting through said drive rollers, turns said belt in the same rotary direction as said wheel to propel said vehicle over the snow, and

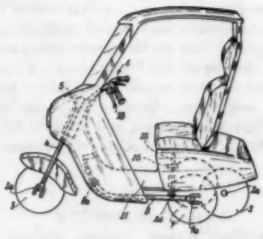
e. means operable to adjust said means for attaching said attachment frame to said vehicle to vary the vertical elevation of said frame relative to said vehicle, whereby said drive rollers may both be pressed against the rubber tire of said vehicle wheel for optimum drive pressure, and also adapted to engage vehicle wheels of different diameters, said adjusting means comprising a pair of generally vertical screws secured rotatably to said attachment frame at respectively opposite sides of said vehicle wheel, and a pair of generally vertical nuts each secured non-rotatably at its upper end to said vehicle frame at the axle of said vehicle wheel, each of said nuts having threaded engagement with one of said screws, whereby rotation of said screws in said nuts will change the elevation of said attachment frame relative to said axle.

4,488,617

FOUR-WHEEL VEHICLE

Christian Jaulmes, Paris, France, assignor to Ateliers de la Motobecane, Pantin, France

Filed May 4, 1983, Ser. No. 491,584
Claims priority, application France, May 12, 1982, 82 08217
Int. Cl.³ B62K *5/00*
U.S. Cl. 180—209 **8 Claims**



1. A four wheeled vehicle having a longitudinal plane of symmetry, said vehicle being drivable in a manner similar to a moped or the like, the four wheels of said vehicle being arranged in a rhombus pattern and including a rear drive wheel and a front steering wheel, said vehicle comprising a frame and a front fork, said front wheel being carried in said fork, a handlebar mounted on said fork, said four wheels further comprising a pair of side wheels each mounted in a yoke, each said yoke comprising a central branch, said frame comprises a common stationary horizontal shaft disposed generally perpendicular to said plane of symmetry, means to mount said central branches of said yokes to the end regions of said horizontal shaft, a whippletree, arm means connecting each end of said whippletree to each said central branch of said yokes, said whippletree comprises a secondary shaft disposed generally parallel to said plane of symmetry and connecting said whippletree to a central region of said horizontal shaft, means cooperable with said secondary shaft to cause said secondary shaft to pivot about the axis of said horizontal shaft against a force exerted on it tending to make it swing due to force generated by interaction of said side wheels with the ground, said cooperable means comprising a spring loaded framework joining said secondary shaft to said vehicle frame, and means to lock said yokes with respect to said vehicle frame.

4,488,618

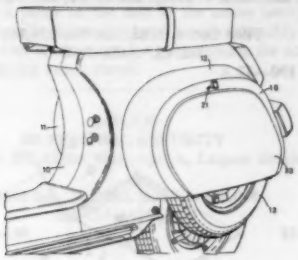
BODY FOR MOTORSCOOTER

Bruno Gaddi, Pisa, Italy, assignor to Piaggio & C. S.p.A., Genoa, Italy

Filed Dec. 3, 1982, Ser. No. 446,615
Claims priority, application Italy, Dec. 9, 1981, 23723/81[U]
Int. Cl.³ B62K *11/10*
U.S. Cl. 180—219 **3 Claims**

1. In a motorscooter provided with a spare wheel: a bearing body comprising lateral cowls formed solidly with said body and opened downwardly, in opposite position with respect to one of said cowls, inside said bearing body, there being fixed a frame which defines with the cowl a seat for the spare wheel, said spare wheel being removable from the seat out of the bearing body by a sliding movement downwardly through the

opening of the cowl, restraining means for securing in a releasable manner said spare wheel to the frame, there being formed



in said cowl an aperture closed by a lockable door for access to the restraining means.

4,488,619

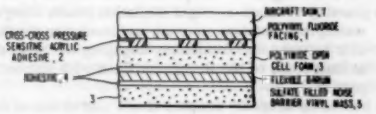
FOAM-BARRIER-FOAM-FACING ACOUSTICAL COMPOSITE

Justin T. O'Neill, P.O. Box 175, Milford, Conn. 06460

Filed Apr. 11, 1984, Ser. No. 599,118

Int. Cl.[3] **E04B** *1/82;* **C04B** *43/00;* **B32B** *3/06, 5/32*

U.S. Cl. 181—290 **40 Claims**



1. A multilayered laminated fabric having improved acoustical and flame retardant properties comprising:

(a) a flame retardant polyvinyl fluoride facing layer,

(b) a fire resistant acrylic adhesive layer bonded to said polyvinyl fluoride facing layer,

(c) a first polyimide open cell foam layer bonded to said adhesive layer,

(d) a noise barrier layer bonded to said first polyimide open cell foam layer, and

(e) a second polyimide open cell foam layer bonded to said noise barrier layer.

4,488,620

CLIMBING APPARATUS

Larry R. Gibson, Rte. 6, Box 486, Easley, S.C. 29640

Filed Oct. 5, 1979, Ser. No. 82,276

Int. Cl.[3] **A01M** *31/02;* **A45F** *3/26;* **A47C** *9/10*

U.S. Cl. 182—135 **2 Claims**

1. Apparatus for climbing trees and the like comprising:

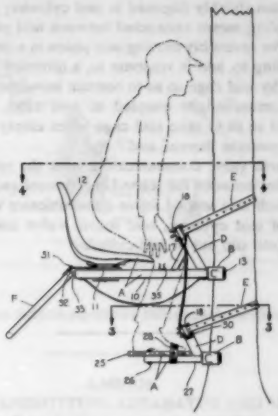
an elongated body support member extending laterally outwardly from a tree;

a headpiece carried on one end of said body support member having means engaging said tree;

a standard carried by said body support member adjacent said headpiece extending upwardly and outwardly from said tree at an obtuse angle with said body support member;

a flat flexible steel band carried adjacent an upper end of said standard encompassing said tree; and

support means for carrying said strap fixed to said standard for securing said strap in diverging relation to said headpiece at approximately a right angle to said standard;



whereby said headpiece is wedged inwardly into engagement with said tree.

4,488,621

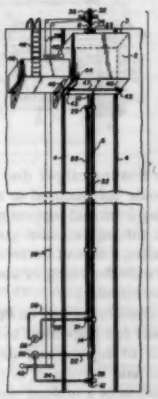
EMERGENCY ELEVATOR

Herbert L. Schiewe, 6550 Fraser St., Vancouver, British Columbia, Canada V5X 3T3

Filed Dec. 17, 1981, Ser. No. 331,735

Int. Cl.[3] **B66B** *5/00*

U.S. Cl. 187—70 **6 Claims**



1. An elevator comprising:

(a) a cage;

(b) guide means for guiding said cage during movement thereof;

(c) an upwardly disposed cylinder having closed first and second ends and first and second end portions adjacent thereto respectively;

(d) first and second valves communicating with the interior of said cylinder adjacent the first and second end portions thereof respectively, each of said valves restricting fluid flow into and out of said cylinder;

(e) a third valve communicating with the interior of said cylinder between the first end thereof and the position at

which said first valve communicates with the interior of said cylinder, said third valve restricting fluid flow into and out of said cylinder;

(f) a piston slidably disposed in said cylinder;

(g) coupling means connected between said piston and said cage for reversibly moving said piston in a direction corresponding to, and in response to, a direction moved vertically by said cage so as to restrain movement thereof;

(h) a counterweight coupled to said cage, of sufficient weight so as to raise said cage when empty to an uppermost position thereof; and

(i) a fourth valve communicating with the interior of said cylinder between the second end thereof and the position at which said second valve communicates with the interior of said cylinder, said fourth valve restricting fluid flow into and out of said cylinder.

4,488,622

SPOT-TYPE FLOATING-CALIPER DISC BRAKE

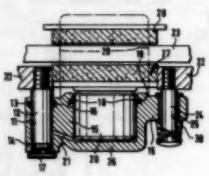
Roberto Stoka, Nauheim, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Feb. 26, 1982, Ser. No. 352,408

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1981, 3121893

Int. Cl.³ F16D *55/224, 65/72*

U.S. Cl. 188—72.3 **7 Claims**



1. A spot-type floating-caliper disc brake comprising:

at least one guide bolt secured to a brake support member and extending from said support member perpendicular to a brake disc through an axial guide bolt bore of a brake caliper adjacent a side of brake cylinder disposed in said caliper, the cylinder being in communication with a hydraulic brake circuit;

a first and a second brake pad on opposed sides of said disc, said first brake pad responsive to movement of a piston in said cylinder to engage said disc and said second pad responsive to said movement of the caliper to engage the disc on initiation of a braking operation;

a pair of sealing rings each disposed adjacent different ends of said axial bore to form a pressure chamber in said axial bore between said sealing rings with said guide bore being in communication with said hydraulic brake circuit to aid in the restoration of the caliper on termination of a braking operation, at least one of said pair of sealing rings being a roll-back seaing ring to restore said caliper to a nominal brake clearance after a braking operation; and a second guide bolt extending between said brake support member and said caliper, and in which said communication from the hydraulic brake circuit comprises a pressure line extending only to the axial bore of the first-mentioned guide bolt to lubricate said first-mentioned guide bolt during a breaking operation.

4,488,623

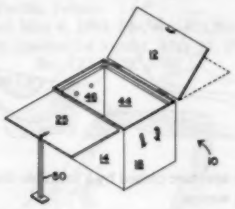
CANOE TRAVEL BOX

William S. Linnell, II, 25 Clinton St., South Portland, Me. 04106, and Merle F. Libby, R.F.D. #3, Box 74, Caribou, Me. 04736

Filed Oct. 6, 1983, Ser. No. 539,541

Int. Cl.³ A45F *3/00*

U.S. Cl. 190—12 A **10 Claims**



10. A canoe travel box comprising:

an elongate box comprising a pair of elongate rectangular side box panels, an elongate rectangular bottom box panel, and a pair of end box panels adjoining said elongate side box panels and bottom box panel, said box panels secured at respective adjoining edges of the box panels by vertical and horizontal square section posts inside the box lying along and abutting the adjoining edges of the box panels, said posts defining between adjacent parallel posts flat spaces coplanar with each of said respective box panels for receiving insulation panels flush with said box panels;

a plurality of relatively rigid insulation panels comprised of waterproof flotation material, said insulation panels insertable between and frictionally engaging the posts defining at least some of the flat spaces flush with respective box panels;

a box cover hingedly coupled at one side to one of said side box panels for opening and closing through an arc of at least 180°, said box cover comprising cover latch means on the side opposite the hinged side for releasable closure engaging the other side box panel;

a table panel for providing a table surface for table use adjacent to said box, said table panel formed with projecting brackets on one side thereof, and one of the side box panels of said box formed with receiving brackets for receiving the ends of said projecting brackets for rigidly securing the table panel to the upper edge of said side box panel with the table panel projecting away from the box during table use;

means for securing the table panel to the undersurface of said box cover for storage during canoe travel so that access to the inside of the box may be readily achieved during canoe travel by simultaneously opening the box cover and secured table panel without interference from the table panel, said means for securing the table panel to the undersurface of the box cover comprising retaining guide means secured to one side of the undersurface of the box cover for engaging one edge of the table panel, said table panel formed adjacent to the opposite edge with means for securing said table panel against the undersurface of the box cover;

supporting leg means for supporting the outer edge of the table panel projecting away from the box when weight is bearing on said table panel projecting away from the box when weight is bearing on said table panel during table use, said supporting leg means comprising coupling means at the end thereof for coupling the top of said supporting leg means to the underside of the table panel;

flexible loop handle means formed on each end box panel for carrying said canoe travel box, said flexible loop handle means formed with quick disconnect couplings for releasably opening and closing the handle loop means, said

flexible handle loop means formed with sufficient length for securing said handle loop means over a strut of a canoe during canoe travel and for quickly releasing said handle loop means from the canoe;

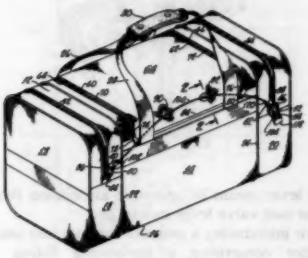
said side box panel on the side of the cover latch means comprising complementary latch means releasably engaging the cover latch means for quick release for access to the box during canoe travel.

4,488,624

DUFFLE BAG SECURITY

Jay E. Myers, 353 Cedar Way, Apt. A, Laguna Beach, Calif. 92651

Filed Jun. 20, 1983, Ser. No. 506,048
Int. Cl.³ A45C *3/00*
U.S. Cl. 190—120 **13 Claims**



1. An article of luggage comprising

a bag body,

closure means movably connected to the bag body for selectively blocking and permitting access to the bag interior,

a plurality of latching devices for holding said closure means in closed position wherein access to the bag interior is blocked, each said device including a latch member mounted for motion relative to the bag body,

a flexible cable engaged with the latch members of at least a group of said latching devices to restrain motion of said latch members, one end of the cable being permanently secured to said bag body, and

locking means for locking the cable to said bag body and latch members, said locking means comprising a lock bracket secured to the bag body, and means for detachably locking the other end of the cable to said lock bracket.

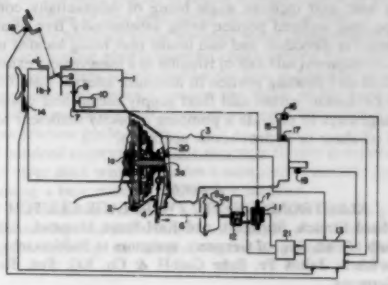
4,488,625

CLUTCH CONTROL SYSTEM FOR AUTOMOBILES

Kazutoshi Nobumoto, and Shizuo Sumida, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Apr. 29, 1982, Ser. No. 373,161
Claims priority, application Japan, May 1, 1981, 56-66269; Sep. 3, 1981, 56-138886
Int. Cl.³ B60K *41/22*
U.S. Cl. 192—3.58 **8 Claims**

1. A clutch assembly comprising a driving member and a driven member which are adapted to be brought into frictional engagement with each other, clutch actuating means for bringing said driving and driven members into mutual frictional engagement, control means including detecting means for detecting the rate of decrease in engine speed and producing an output representing the engine speed decrease rate, means responsive to the output of the detecting means for stopping the movement of said clutch actuating means when a decrease in the engine speed is detected during the engaging operation of the clutch actuating means, said detecting means being provided with means for detecting a positive differential coefficient of the engine speed and generating an output, said control means including means to allow the clutch actuating means to perform the clutch engaging operation when said



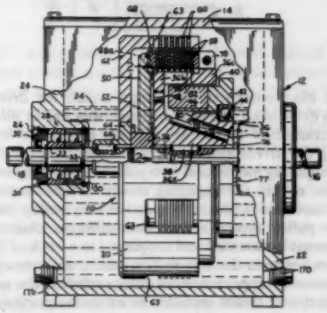
detecting means detects a positive differential coefficient of the engine speed.

4,488,626

TORQUE TRANSMITTING APPARATUS AND METHOD

Kenneth E. Handke, c/o Electromatic, Inc., 3615 Superior Ave., Bldg. 42, Cleveland, Ohio 44114

Filed Aug. 6, 1981, Ser. No. 290,416
Int. Cl.³ F16D *31/00*
U.S. Cl. 192—70.12 **26 Claims**



1. A torque transmitting unit of the disc type wherein films of fluid are maintained between adjacent disc means for purposes of torque transmission, comprising first disc means adapted to be operatively connected to an input shaft received within a central shaft bore extending along an axis of rotation and second disc means adapted to be operatively connected to an output element, closing means for controlling the relative axial proximity of said first and second disc means to thereby control the thickness of fluid films between adjacent disc means and the transmission of torque, a housing for confining fluid and providing a reservoir of fluid, a rotating portion extending into said reservoir of fluid, and fluid supply means adapted to continuously deliver fluid from said reservoir of fluid to the innermost extent of said disc means, said fluid supply means comprising a plurality of passageways in said rotating portion of said torque transmitting unit, each of said passageways extending from a first location adjacent said shaft bore for intake of fluid to a radially outward second location for delivery of fluid to said disc means, each of said passageways including an inclined portion extending from an intake port adjacent said first location to said second location for delivery of fluid to said disc means, said inclined portion comprising a major extend of said passageways said inclined portion of said passageway being disposed at a sufficiently steep inclined angle with respect to said shaft bore to draw fluid into

said passageway directly from said reservoir of fluid at said first location due to the centrifugal pumping action developed upon rotation of said rotating portion of said torque transmitting unit, said inclined angle being of substantially constant slope, said inclined portion being substantially free of abrupt changes in direction, and said intake port being located immediately adjacent said axis of rotation in a transversely extending wall of said rotating portion to minimize internal fluid friction and cavitation within said fluid supply means and cause said passageways to provide a pumping capacity sufficient to sustain oil shear or hydroviscous operation.

4,488,627

ELECTROMAGNETIC TWO-STAGE CLUTCH

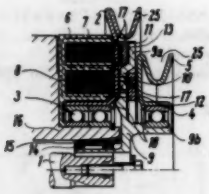
Gerhard Streich, Stuttgart, and Karl-Ernst Hummel, Altbach, both of Fed. Rep. of Germany, assignors to Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG, Fed. Rep. of Germany

Filed Sep. 3, 1981, Ser. No. 299,108

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1980, 3033140

Int. Cl.³ F16D *27/12, 27/10*

U.S. Cl. 192—48.2 **16 Claims**



1. An electromagnetic two-stage clutch for driving units having a drive shaft, the clutch comprising driver means operatively connected to the drive shaft, means for frictionally engaging the driver means, electromagnetic means for actuating the engaging means, and two pulley means cooperable with the driver means, the engaging means includes armature disk means associated with the respective two pulley means, and the two pulley means are of two different diameters, said driver means is mounted and supported in a neck of the unit at a position between the two pulley means, and one of the two pulley means is supported on an outer surface of the neck of the unit, said driver means includes an extension portion, a larger of the two pulley means is supported on the outer surface of the neck of the unit and the smaller of the two pulley means is supported on the extension portion.

4,488,628

FLUID FRICTION CLUTCH WITH ACTUATOR

Vlastimil Kluna, Kornwestheim, and Werner Hummel, Affalterbach, both of Fed. Rep. of Germany, assignors to Sueddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG, Stuttgart, Fed. Rep. of Germany

Filed Sep. 8, 1982, Ser. No. 415,926

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1981, 8126744

Int. Cl.³ F16D *25/06, 35/00*

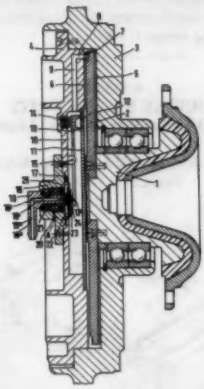
U.S. Cl. 192—58 B **13 Claims**

1. A fluid friction clutch comprising:

a rotatable assembly comprising a working chamber connected with a working fluid reservoir, the presence of working fluid in said working chamber serving to transfer torque between a rotatable disc disposed in said working chamber and said rotatable assembly;

valve lever means for controlling the admission of working fluid from said working fluid reservoir to said working chamber;

means for actuating said valve lever means comprising a pressure chamber comprising a pressure chamber housing and a flexible membrane, said pressure chamber housing and said flexible membrane being fixedly joined to said rotatable assembly to rotate therewith, and said membrane carrying a pressure plate bearing directly against said



valve lever means in operative association therewith to actuate said valve lever means, and

means for introducing a pressure medium into said pressure chamber comprising a connecting fitting pivotably mounted on said pressure chamber housing.

4,488,629

TORSIONAL DAMPERS

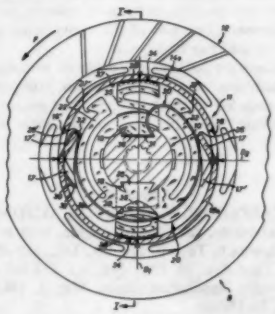
Pierre Loizeau, Ville d'Avray, France, assignor to Valeo, Paris, France

Filed Jan. 28, 1982, Ser. No. 343,581

Claims priority, application France, Feb. 4, 1981, 81 02112

Int. Cl.³ F16D *3/12, 3/14*

U.S. Cl. 192—106.1 **21 Claims**



1. A torsional damper suitable for use in a clutch plate of an automotive friction clutch, said torsional damper comprising at least two coaxial parts mounted to rotate relative to one another within a defined range of relative angular movement, elastic means disposed circumferentially between said coaxial parts and opposing relative angular movement of said coaxial parts, and friction means operatively disposed between said coaxial parts and including at least one friction pad which is constrained to rotate with one of said coaxial parts and is urged independently of said elastic means into frictional engagement with an axial surface constrained to rotate with the other of said coaxial parts, said axial surface being non-circular in transverse cross-section whereby frictional contact between said

friction pad and said axial surface provides a hysteresis effect which varies with relative angular position of said coaxial parts.

4,488,630

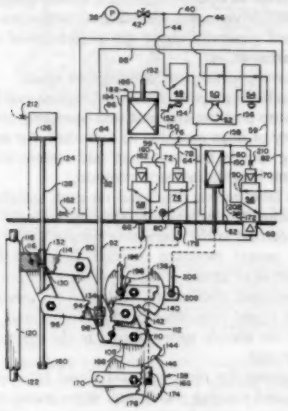
MOVABLE BARRIER APPARATUS

Edwin W. Plumb, Woodbury, Conn., assignor to Gated Devices, Inc., Woodbury, Conn.

Filed Jun. 22, 1981, Ser. No. 276,162

Int. Cl.³ F16P 3/04

U.S. Cl. 192—134 **18 Claims**



1. Safety apparatus for a machine such as a power press and the like and comprising a barrier movable between a starting position in remote relation to a work area and an operative position in obstructing relation thereto precluding operator access, first and second cams for controlling machine cycling, an interlock cam cooperating with the first and second cams and drivingly connected to the barrier for rotation in synchronism with barrier movement, a machine tripping device for actuating power operation of the machine responsive to rotation of the first and second cams, the interlock cam locking the first and second cams against rotation when the barrier is in any position other than its operative position.

4,488,631

BALUSTRADE

Iber C. Courson, Gettysburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 16, 1982, Ser. No. 399,408

Int. Cl.³ B66B 9/14

U.S. Cl. 198—335 **5 Claims**

1. A balustrade, comprising:

upstanding balustrade panels having upper and lower edges,

a handrail support and guide structure mounted above the upper edges of said panels,

said handrail support and guide structure including an elongated, non-metallic unitary handrail guide member having a cross-sectional configuration which is substantially T-shaped at its upper end, and in the form of an inverted U-shape at its lower end,

said substantially T-shaped configuration including a central body portion having first and second side portions which extend outwardly to provide first and second integral, lateral projections sized to support and guide an endless, moving handrail,

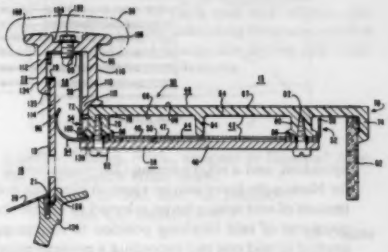
an endless handrail mounted for movement on said unitary handrail guide member and a lower support structure for receiving the lower edges of the balustrade panels,

said inverted U-shaped portion being defined by said central body portion, with its first and second side portions defining the outer surfaces of first and second integral, depending leg portions, spaced to define a channel receiving the upper edges of said upstanding balustrade panels,

said unitary handrail guide member being constructed of a self-lubricating plastic material characterized by a coefficient of friction which enables the first and second lateral projections to directly contact the inside of the handrail while it is moving, and eliminate the need for intervening low-friction guide pieces,

said handrail support and guide structure further comprising an outer deck which includes a composite assembly comprising a base member and a deck member,

said base member including a substantially flat metallic portion having first and second lateral edges, with one of said edges defining an integral, upstanding handrail guide



support which extends into the channel defined by the first and second spaced leg portions of said unitary handrail guide member, converging directly under the handrail with the upper edges of said balustrade panels to support said unitary handrail guide member with installation and removal of the balustrade panels being facilitated by the channel structure of the handrail guide member, wherein the channel receiving the upper edges of the balustrade panels is dimensioned to enable the panels to be lifted upwardly into the channel, and then lowered into said lower support structure, with the balustrade panels still being within the channel in their assembled position, with spring means fixed to the base member of the composite assembly, and disposed to bias the balustrade panels during installation of the panels, and against only a predetermined one of the spaced leg portions of the unitary handrail guide member after installation.

4,488,632

CIGARETTE GROUPING APPARATUS WITH YIELDABLE STOP MEMBER

Heinz Focke, Verden, and Hugo Mutschall, Kirchlinteln, both of Fed. Rep. of Germany, assignors to Focke & Co., Verden, Fed. Rep. of Germany

Filed Mar. 23, 1982, Ser. No. 361,155

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1981, 3116156

Int. Cl.³ B65G 47/26

U.S. Cl. 198—420 **4 Claims**

1. An apparatus for forming pack groups of cigarettes, comprising:

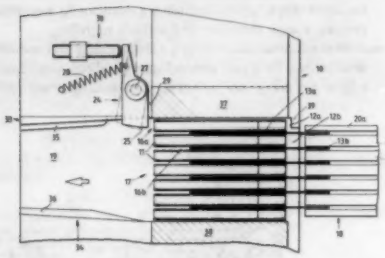
(a) a magazine (10) defining, at a bottom discharge end thereof, a plurality of closely adjacent vertical shafts (12) each accommodating a plurality of horizontally oriented cigarettes (11) singly stacked above one another,

(b) horizontally reciprocable pusher means (18) disposed adjacent the bottom end of the magazine and laterally insertable thereinto to simultaneously eject a group of cigarettes from said shafts, said group comprising at least two superimposed layers of cigarettes with a first one of

said layers having at least one more cigarette than a second one of said layers, and

(c) a stop member (24) mounted adjacent an ejection side of one of the magazine shafts for retaining at least one cigarette (11a) of the second layer in the shaft during normal operation of the apparatus,

(d) said stop member comprising a pivotably mounted lever (27), one end (25) of the lever extending laterally across an ejection path of said at least one cigarette during normal



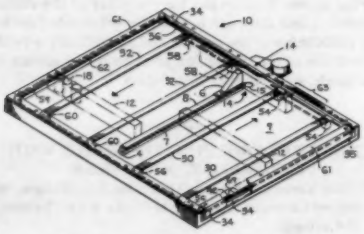
operation, and a return spring (28) connected to the lever for biasing the lever into an ejection blocking position, the tension of said spring being selected to enable the lever to pivot out of said blocking position in response to a load applied to said one end exceeding a predetermined level to thereby enable the ejection of said at least one cigarette, whereby jamming and blockage due to non-uniform cigarette configurations and non-uniform stacking configurations in the magazine shafts are avoided.

4,488,633

APPARATUS FOR TRANSPORTING SAMPLE HOLDERS

Richard S. Kampf, Costa Mesa, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Dec. 15, 1981, Ser. No. 330,931
Int. Cl.³ B65G *37/00*
U.S. Cl. 198—472 **8 Claims**



1. Apparatus for transporting elongated sample holders past an operating station in a sample holder storage compartment, wherein each sample holder is adapted to contain a row of sample tubes of uniform size and wherein said sample holders may include a plurality of types, each type characterized by the size of the sample tubes the sample holder is adapted to contain and the incremental spacing provided therebetween, and each type having in common a registration surface on a first elongated side spaced a predetermined distance from the center line of said sample tubes, and a horizontal groove extending the length of the second elongated side; said apparatus comprising:

a first continuous conveyor means on one side of said operating station for conveying sample holders positioned thereon in a first longitudinal direction toward said station;

first guide means adjacent one end of said first conveyor means for halting the motion of sample holders in said first longitudinal direction, and to define a first longitudinal stop position for each sample holder;

said first longitudinal stop position situated adjacent said operating station;

lateral drive means for engaging each sample holder in said first longitudinal stop position and for moving said sample holders laterally along said guide means into and then away from an operative position at said operating station;

said lateral drive means including a continuous roller chain disposed generally about the periphery of said storage compartment;

means for supporting and driving said chain;

said chain having a path of travel alongside said first longitudinal stop position and past said operating station;

a plurality of dogs mounted to said chain for engaging and driving sample holders when said sample holders are in said first longitudinal stop position;

encoded label means displayed on each sample holder for indicating the incremental spacing between the sample tubes carried in the respective sample holder;

detector means mounted on said sample holder storage compartment ahead of said operating station for reading said encoded label means, said detector means having an output signal indicative of the incremental spacing between the sample tubes carried in the respective sample holder; and

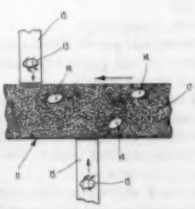
control means for receiving said signal from said detector means and causing said lateral drive means to move the respective sample holder in accordance with said signal and thereby automatically position, in turn, each sample tube of the sample holder in an operative position at the operating station.

4,488,634

METHOD OF REDUCING DAMAGE TO FOODSTUFFS USING CUSHIONING AQUEOUS FOAMS

William T. West, Wayne, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Apr. 26, 1982, Ser. No. 371,866
Int. Cl.³ B65G *45/00*
U.S. Cl. 198—493 **11 Claims**

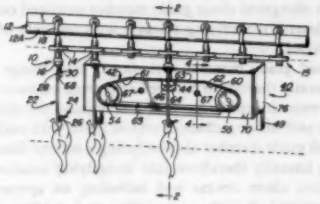


1. A method of reducing damage to fragile foodstuff during handling comprising protecting said foodstuffs by substantially surrounding the surface area of said foodstuffs with a stiff cushioning layer of aqueous foam formed by mixing a foam forming material with water.

4,488,635
METHOD AND APPARATUS FOR WEIGHING A PRODUCT SUSPENDED FROM A TRAVELING CONVEYOR

Richard D. Linville, P.O. Box 7, Pleasant Valley, Iowa 52767

Continuation of Ser. No. 227,141, Jan. 21, 1981, abandoned. This application Jan. 25, 1983, Ser. No. 460,946
Int. Cl.³ G01G 19/14
U.S. Cl. 198—504 11 Claims



11. Apparatus for weighing products carried by shackles which are suspended in spaced relationship from an overhead traveling conveyor, comprising

a single, endless weighing conveyor element having a working run disposed below and in the same vertical plane as a portion of said overhead conveyor and traveling in the same direction and at substantially the same speed as said portion of said overhead conveyor,

each of said shackles being removably suspended from said overhead conveyor and including a shackle support portion having a surface which is adapted to rest on said weighing conveyor element,

said weighing conveyor element having an upwardly sloping ramp portion for intercepting said shackle support portions of said shackles and for lifting said shackles from said overhead conveyor as they are carried up said ramp portion,

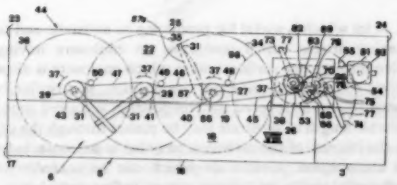
said shackles further including a product support portion extending vertically along one side and extending laterally beneath said conveyor element for supporting a product below said conveyor element in vertical alignment with said vertical plane, and

means for weighing said product while it is supported by said conveyor element.

4,488,636
FEEDER MECHANISM FOR AGRICULTURAL BALER

Frans J. G. C. De Coene, Zedelgem, Belgium, assignor to Sperry Corporation, New Holland, Pa.

Filed Aug. 20, 1981, Ser. No. 294,861
Claims priority, application United Kingdom, Aug. 30, 1980, 8028103
Int. Cl.³ B65G 29/00
U.S. Cl. 198—608 21 Claims



1. In a baler having a bale case, a feed platform adjacent said bale case, first feed means for feeding crop material across said feed platform toward said bale case, second feed means for feeding crop material from said feed platform into said bale case comprising feeder elements rotatable about a first axis and about a second axis offset relative to said first axis, drive means connected to said feeder elements causing said feeder elements to rotate around said first axis in one direction while said feeder elements are being rotated around said second axis in the opposite direction, said feeder elements being angularly displaced around said first axis in said one direction over an angle which is about one-half the angular displacement of said feeder elements around said second axis in said opposite direction whereby said feeder elements make a resultant movement around said second axis in said opposite direction along a predetermined path; the improvement comprising:

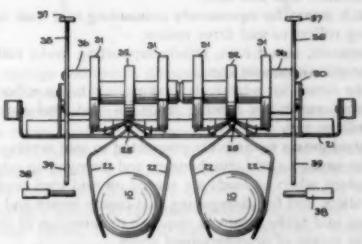
said feeder elements each having an arm section and a tine section disposed substantially perpendicular to said arm section so that a leading edge of each said tine section moves ahead of a straight line extending between said second axis and the free end of said tine section during said resultant movement of said feeder elements, and

wherein said leading edge of each said tine section also moves ahead of a straight line extending between said first axis and the free end of said tine section during said resultant movement of said feeder elements.

4,488,637
EGG CARRIER

Thomas V. Loeffler, Fenton, Mich., assignor to Diamond Automations, Inc., Farmington Hills, Mich.

Filed Jul. 1, 1982, Ser. No. 394,430
Int. Cl.³ B65G 47/86
U.S. Cl. 198—653 16 Claims



8. An apparatus suitable for engaging an article to be carried from a first station to a second station which comprises,

a platform movable between the first and second stations,

a pair of oppositely disposed article engaging members coupled to said platform and adapted for grasping the article from the first station and for releasing the article at the second station, said article engaging members being pivotally movable with respect to one another so as to engage the article in the closed position and release the article in the open position, said engaging members having a downwardly depending portion for engaging the article to be carried and having an upper surface thereof in a substantially horizontal orientation,

a support shaft mounted on said platform on which said engaging members are disposed so as to be pivotally movable with respect to one another,

a cam means disposed above said platform in engagement with the upper surface of each of said engaging members to effect a pivotal movement thereof, and further comprising a mounting shaft disposed generally perpendicular to said support shaft upon which said cam means is mounted, a spacer member disposed on said mounting shaft for connecting each of said cam means disposed over the respective article engaging member to effect simultaneous movement thereof, and

a movable bar member rotatably mounted on said mounting shaft and being coupled to said cam means so that when said bar member is engaged and rotated said cam means is

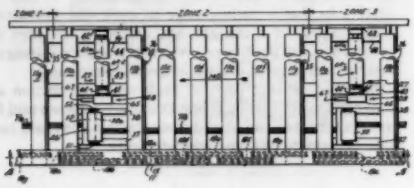
rotated therewith so as to acutate the opening and closing of said article engaging members.

4,488,638

LIVE ROLLER ACCUMULATING BRAKE CONVEYOR

Steven J. Morgan, Jeffersonville, Ind.; Frank M. Lauyans, and Gregory R. Judge, both of Louisville, Ky., assignors to Figgie International Inc., Willoughby, Ohio

Filed May 27, 1982, Ser. No. 382,594
Int. Cl.³ B65G *47/26, 13/06*
U.S. Cl. 198—781 **10 Claims**



1. A live roller accumulating conveyor for conveying articles and having a plurality of rollers divided into discrete accumulating zones, each zone including:

conveyor side rails;

at least two driven load supporting rollers;

drive means for selectively driving said rollers disposed between said side rails;

clutch means for operatively connecting said load supporting rollers to said drive means;

a separate, non-driven, article supporting brake roller disposed within said zone;

brake means for selectively braking said brake roller;

sensing means for sensing loads on said load supporting rollers; and,

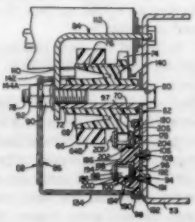
control means operatively connected to said sensing means for engaging said clutch means and disengaging said brake means when no loads are sensed on said load supporting rollers, and for disengaging said clutch means and engaging said brake means in response to actuation of the sensing means of predetermined zones.

4,488,639

ROLLER CONVEYOR WITH FRICTION ROLL DEVICE

Robert K. Vogt, and Martin A. Heit, both of Cincinnati, Ohio, assignors to E. W. Buschman Company, Cincinnati, Ohio

Continuation of Ser. No. 299,693, Sep. 8, 1981, abandoned, which is a continuation of Ser. No. 914,060, Jun. 9, 1978, abandoned. This application Aug. 25, 1983, Ser. No. 526,507
Int. Cl.³ B65G *13/08*
U.S. Cl. 198—787 **14 Claims**



1. A live roller conveyor, comprising

(a) a frame,

(b) a plurality of live rollers rotatably mounted on said frame,

(c) a plurality of power drive wheels,

(d) means for rotatably mounting each of said drive wheels on said frame underlying said live rollers with each of said drive wheels in driving engagement with at least one of said rollers,

(e) a sprocket rotatably mounted on said frame in driving relation with each of said drive wheels,

(f) a drive chain including a driving course for said sprockets running below said sprockets and a return course running below said driving course,

(g) an elongated chain guide member mounted on said frame in laterally overlying relation with one side of said chain courses,

(h) said guide member including a first flange projecting laterally therefrom between said chain courses and having thereon an upwardly facing elongated shoulder supporting said driving chain course in mesh with said sprockets,

(i) said guide member also including a second flange projecting laterally therefrom into underlying relation with said return chain course and including an upwardly facing elongated shoulder supporting and guiding said return chain course, and

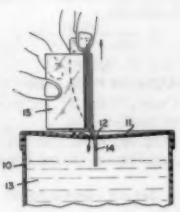
(j) means for driving said chain to drive said wheels and said live rollers.

4,488,640

KIT FOR PRODUCING ANTISTATIC AND FABRIC SOFTENING ARTICLE

Yuen P. Leung, Montville, N.J., assignor to Beecham Inc., Clifton, N.J.

Filed Oct. 10, 1978, Ser. No. 949,793
Int. Cl.³ B05C *3/09;* **B65D** *69/00*
U.S. Cl. 206—229 **1 Claim**



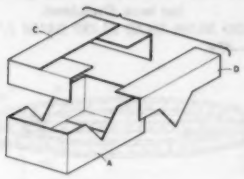
1. A kit which is useful for producing an antistatic and fabric softening article which comprises an enclosure having an orifice through one surface within which enclosure is disposed a fabric softener and antistatic composition, said orifice being located above the level of the composition and sized such that a suitable length of substrate may be passed through the orifice into the interior of the enclosure in order to be contacted with said composition, a substrate which can be coated with or impregnated with said composition before initial use and which can be re-coated or re-impregnated after initial use, and a folded sheet of rigid material through which the substrate is passed as it is removed from the orifice to remove excess composition from such substrate after it has been coated or impregnated, initially or subsequently.

4,488,641

PACKING CASE OF CORRUGATED PAPER AND POSITIONING METHOD OF AN ARTICLE USING THE SAME

Takuji Nishiguchi, Osaka, and Hideo Yoshimoto, Izumi, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 2, 1983, Ser. No. 471,300
Claims priority, application Japan, Mar. 2, 1982, 57-29752[U]
Int. Cl.³ B65D *85/64*
U.S. Cl. 206—320 **5 Claims**



1. A packing case for housing a device, said packing case containing fold lines and being separated along a cut line which extends along the four sides thereof into an upper portion and a lower portion, said cut line forming opposing V-shaped slots in at least two opposing sides of said lower portion, said upper portion being further separated into a first portion and a second portion, said second portion being folded along its fold line into a V-shaped surface which is disposed across the packing case in complimentary position to the V-shaped slots in the bottom portion thereby providing a transverse support surface across the packing case for receiving the edge portion of the device and supporting said device to facilitate mounting of the device to a wall.

4,488,642

POLYMERIC ARTICLES

Pushpkumar D. Changani, Swindon; Donald G. Peacock, Kempsford, and David Roberts, Swindon, all of England, assignors to Raychem Limited, London, England

Division of Ser. No. 172,889, Jul. 28, 1980, Pat. No. 4,349,404.
This application Jun. 22, 1982, Ser. No. 391,034
Int. Cl.³ B65D *85/20, 63/00*
U.S. Cl. 206—345 **7 Claims**

1. A marker sleeve assembly of individual, open-ended tubular marker sleeves detachably joined together, comprising, in combination:

a first sheet and a second sheet of flexible material arranged in face-to-face relationship and having longitudinal axes disposed parallel to one another, the first sheet being transversely wider than the second sheet such that the first sheet has at least one longitudinal marginal edge portion extending beyond the corresponding longitudinal edge of the second sheet;

a plurality of spaced transverse seams joining the first and second sheets together at preselected intervals, the transverse seams being arranged perpendicular to the longitudinal axes of the first and second sheets, each adjacent pair of transverse seams defining opposed closed edge portions of an individual marker sleeve; and

separable line means defined in the marginal edge portion of the first sheet, the separable line means being parallel to the longitudinal axis of the first sheet, the separable line means and the adjacent longitudinal edge of the second sheet defining an open end of a marker sleeve,

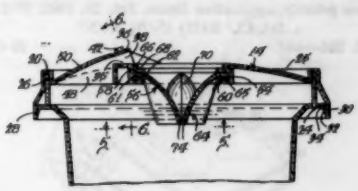
each individual, open-ended tubular marker sleeve being detachable from the assembly along said transverse seams and said separable line means.

4,488,643

SYRINGE AND NEEDLE DISPOSAL SYSTEM

Kenneth V. Pepper, Elkhart Lake, Wis., assignor to Bemis Manufacturing Company, Sheboygan Falls, Wis.

Filed Oct. 28, 1983, Ser. No. 546,324
Int. Cl.³ B65D *25/00*; A61M *5/32*; B02C *19/12*; B26F *1/02, 3/00*
U.S. Cl. 206—366 **17 Claims**



1. A syringe and needle disposal system comprising:

disposal receptacle means;

passive bending means associated with said disposal receptacle means, said bending means including upper and lower bending surfaces disposed externally of said disposal receptacle means in a spaced relationship with respect to each other and defining a channel therebetween for receiving a needle to facilitate bending thereof; and

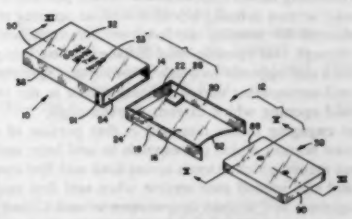
aperture means associated with said disposal receptacle means for allowing passage of a syringe and needle into said disposal receptacle means.

4,488,644

PACKAGING SYSTEM FOR VIDEO CASSETTES

Robert M. Wynalda, Rockford, Mich., assignor to Wynalda Litho Inc., Rockford, Mich.

Filed Feb. 21, 1984, Ser. No. 582,021
Int. Cl.³ B65D *85/672, 85/00, 5/44, 6/06*
U.S. Cl. 206—387 **19 Claims**



1. A video cassette packaging system comprising:

a printed sleeve dimensioned to closely receive a first relatively large cartridge, said sleeve including a closed end and an open end, whereby the first cartridge is packaged

for retail sale simply by sliding the first cartridge into the printed sleeve through the open end; and

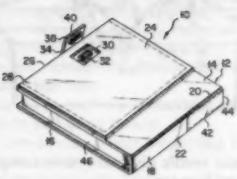
a tray dimensioned to fit within said sleeve, said tray including a floor and a pair of sidewalls extending upwardly from opposite sides thereof, said tray further including an end abutting the closed sleeve end when the tray is positioned within said sleeve, said tray further including spacer means for spacing an object from said tray end, said tray being dimensioned to receive a second relatively small cartridge between said sidewalls and abutting said spacer means, whereby the second cartridge is packaged for retail sale by positioning the second cartridge on said tray and sliding said tray and cartridge thereon into the printed sleeve through the open end until said tray end abuts said closed sleeve end.

4,488,645

CASE FOR HOUSING INFORMATION MEMORY MEDIA THEREIN

Ryoji Yamaguchi, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jan. 18, 1983, Ser. No. 458,874
Claims priority, application Japan, Jan. 29, 1982, 57-12834
Int. Cl.³ B65D *85/30, 85/57*
U.S. Cl. 206—444 **20 Claims**



1. A case for keeping a main information memory medium and an index memory medium for indicating the address of the information stored in said main information memory medium together therein, said case comprising:

a base sheet having a first case section, a second case section, and a third case section having a first connecting portion connecting said first case section with said third case section and a second connecting portion connecting said second case section with said third case section, said first and second connecting portions permitting said first and second case sections to be foldable between an opened position and a closed position wherein said first and second case sections oppose one another while in said closed position, said first and second case sections together defining a space when in said closed position to house said main information medium put therein when said first and second case sections were in said opened position;

surrounding means disposed on a surface portion of said first case section defining a pocket with an opening at one end thereof for housing the index memory medium inserted through said opening, said surface portion being located on a side opposite to a side at which said space is formed, said surrounding means defining a hole in the vicinity of said opening which extends therethrough;

first engaging means disposed in that portion of said first case section which corresponds to said hole; and

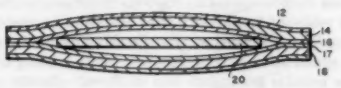
band means which extends across both said first case section and said second case section when said first case section opposes said second case section in said closed position, and one end of which is fixed on said second case section and the other end of which has second engaging means adapted to be engaged with said first engaging means through said hole, said band means for fixing the first case section to the second case section and for preventing the index memory medium from passing beyond said hole and slipping out of said pocket when said first engaging means engages said second engaging means.

4,488,646

TAMPER-INDICATING SHEET

James L. McCorkle, Holden, Mass., assignor to Ludlow Corporation, Needham Heights, Mass.

Division of Ser. No. 007,400, Jan. 29, 1979, Pat. No. 4,407,443.
This application Oct. 3, 1983, Ser. No. 538,345
The portion of the term of this patent subsequent to Oct. 4, 2000, has been disclaimed.
Int. Cl.³ B65D *30/00;* B42D *15/00;* B41M *3/14;* C08J *9/16*
U.S. Cl. 206—459 **23 Claims**



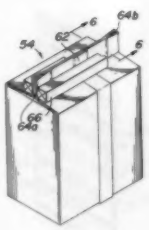
8. A lottery ticket comprising, as an integral portion thereof, a means for detecting thermal and solvent tampering with said ticket, a blush coating comprised of a mass of light-scattering, polymeric particles which are adapted to coalesce to a more compact coating (a) on application of heat thereto or (b) on exposure to an aliphatic solvent or an aromatic solvent, the improvement wherein said mass of particles is in intimate contact with a minor amount of a binder composition which, on exposure to any of a wide spectrum of aromatic or aliphatic solvents, will form means to substantially impair the light-scattering character of said mass of polymeric particles and transform said mass of particles into a more compact, normally translucent coating.

4,488,647

FLEXIBLE PACKAGE WITH EASY OPENING PEEL SEAL

John S. Davis, New Hope, Pa., assignor to Paramount Packaging Corporation, Chalfont, Pa.

Filed Jul. 18, 1983, Ser. No. 514,575
Int. Cl.³ B65D *77/12*
U.S. Cl. 206—525 **12 Claims**



1. A package comprising a body member having side and bottom walls, said body member comprising a flexible laminate having a barrier ply and a sealable ply, said body member having a mouth portion and a hand-peelable seal for said mouth portion, said seal comprising a heat-fusible plastic polymeric coating so constructed and arranged as to have, when sealed, strength sufficient to retain vacuum within said package and to withstand stress attendant handling and shipping of said package, the strength of said seal being such that said seal may be broken by hand manipulation, and said side walls providing gusset portions for said mouth portion, said heat-fusible coating being applied to the inner surface of said body member at said mouth portion, said hand peelable seal encompassing said

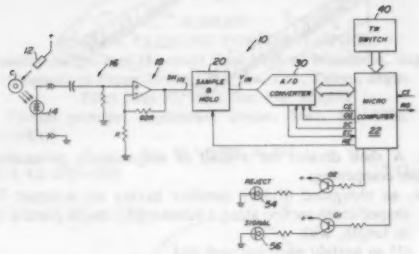
gusset portions as well as the other portions of said mouth portion.

4,488,648

FLAW DETECTOR

Mark P. Claypool, Horseheads, N.Y., assignor to Powers Manufacturing, Inc., Elmira, N.Y.

Filed May 6, 1982, Ser. No. 375,644
Int. Cl.³ B07C 5/34; G01N 21/90; H04N 7/02
U.S. Cl. 209—526 **32 Claims**



1. Method of inspecting containers for manufacturing defects, comprising:

optically scanning a portion of the surface of a container during an inspection interval by causing relative angular displacement between the container and an optical scanner,

generating a signal having a time varying value based on the optical characteristics of the portion of the container surface being scanned,

processing the signal in real time by repetitively computing the time rate of change of the signal,

comparing each computed time rate of change to a preselected number, and

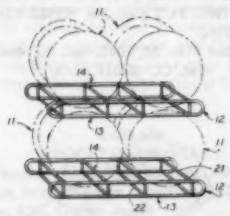
generating a reject signal indicating whether the container should be rejected based on the comparison between the computed time rate of change and the preselected number.

4,488,649

RACK FOR PLURAL CYLINDRICAL OBJECTS

Kelly J. Mark, Modesto, Calif., assignor to Larry D. Watts; Wm. G. Atkins and Mike Harnach, all of Stockton, Calif.

Filed Oct. 27, 1981, Ser. No. 315,430
Int. Cl.³ A47F 5/01
U.S. Cl. 211—49 S **4 Claims**



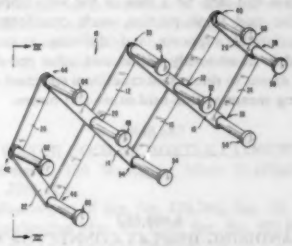
1. A rack for plural reels, each said reel having a major axis, the major axes of said reels being parallel to each other and horizontally spaced apart a distance at least as great as the diameters of said reels, said rack comprising a single, separate unit movable by a forklift and further comprising a first longitudinal member, a second longitudinal member parallel to said first longitudinal member and a plurality of transverse members interconnecting said longitudinally spaced locations, each said longitudinal member comprising a substantially straight, horizontal top longitudinal rail, a substantially straight, horizontal bottom longitudinal rail, and legs spacing said top and bottom longitudinal rails apart and vertically aligned to permit entry of forklift forks, said longitudinal members being of a length at least twice the diameter of said reel, said rack being totally open above said longitudinal members to permit reels to be loaded on said rack from above, said transverse members comprising a top transverse rail and a vertically aligned bottom transverse rail, said transverse rails being connected to said top and bottom longitudinal rails, said transverse members being located aligned vertically with said legs, said top transverse rails being at the same level as said top longitudinal rails and said bottom transverse rails being at the same level as said bottom longitudinal rails.

4,488,650

ADJUSTABLE RACK FOR HANGING ARTICLES

Vito Licari, 875 Ocean Ave., Elberon, N.J. 07740

Filed Nov. 24, 1982, Ser. No. 444,083
Int. Cl.³ A47F 5/08
U.S. Cl. 211—105 **4 Claims**



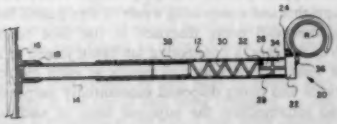
1. In a plastic rack for hanging articles therefrom, said rack including a first frame member and a second frame member pivotally attached to said first frame member by a pin joint, the improvement wherein said pin joint comprises a first sleeve formed integrally with said first frame member, a second sleeve formed integrally with said second frame member, said second sleeve extending only partially into said first sleeve and being rotatably received within said first sleeve, and a hook member extending into said first and second sleeves, said hook member including engaging means formed integrally therewith for engaging said second sleeve to thereby fasten said first frame member to said second frame member, said engaging means including a pin sized and shaped to frictionally engage said second sleeve, said pin including ribs extending radially outwardly therefrom so as to form a snug slip fit with said first sleeve and to engage a free end of said second sleeve.

4,488,651

CLOTHES RACK

Charles W. Bishop, 657 Soudan Ave., Toronto, Ontario, Canada

Filed Feb. 3, 1982, Ser. No. 345,347
Claims priority, application Canada, Feb. 16, 1981, 370983
Int. Cl.³ A47F 5/13
U.S. Cl. 211—105.6 **4 Claims**



3. Support rod apparatus for use in association with two

structures such as a wall, and rail means spaced from such wall, for removably locating a support rod extending between said structures, said apparatus comprising;

outer tubular rod means shorter than the spacing between said structures;

inner rod means telescopically receivable within said outer rod means, and being shorter than the spacing between said structures;

spring means located within said outer rod means, and engageable with said inner rod means for normally biasing the same outwardly of said outer rod means;

wall engaging means on the free end of one said rod means, for engaging said wall;

rail engaging means on the free end of the other said rod means, comprising an integral body of resilient material having a generally flat end stop, an upwardly projecting semicircular hood portion subtending an arc somewhat greater than 180° and adapted to snap over said rail means, a button means on said end stop below the said hook portion adapted to prevent dislodgement of the said hook portion when engaged with said rail means, and a generally elongated cruciform structure projecting normally from said end stop on a side of the stop disposed away from the said hook portion, such cruciform structure having lateral supports and defining a cross-section adapted to fit smoothly within said other rod means, and

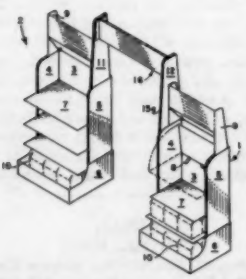
retaining means to retain said cruciform structure of said rail engaging means within said other rod means.

4,488,652

MERCHANDISING DISPLAY CONNECTOR MEANS

Teresa L. Hinton, Norcross, and William S. Spamer, Roswell, both of Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed Mar. 14, 1983, Ser. No. 475,048
Int. Cl.³ A47F 5/00
U.S. Cl. 211—183 **3 Claims**



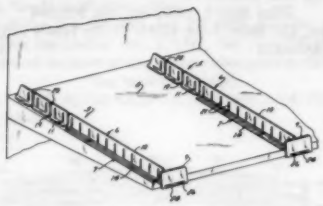
1. Merchandising display connector means comprising a pair of spaced uprights, each of said uprights comprising a pair of support panels, a slot formed in the upper portion of each inner one of said support panels, a display bridge interconnecting said two uprights and comprising a pair of sign panels foldably joined together and being disposed in flat face contacting relation to each other, a connecting tab being joined to an end edge of at least one of said sign panels at each end of said display bridge and being disposed substantially perpendicular thereto and intermediate the adjacent ones of said support panels, and each connecting tab being joined to the associated one of said sign panels along a fold line disposed in close proximity to the associated one of said slots.

4,488,653

MAGNETICALLY MOUNTED SHELF DIVIDER

Paul Belokin, P.O. Box 1907, Denton, Tex. 76201

Filed Mar. 12, 1984, Ser. No. 588,238
Int. Cl.³ A47F 5/10
U.S. Cl. 211—184 **4 Claims**



1. A shelf divider for a shelf of magnetically permeable metal, comprising:

A. an elongated divider member having an inverted T-shaped cross-section along a substantially major portion of its length, with

(1) an upright partition web and

(2) a pair of supporting flanges that project laterally in opposite directions from the bottom of said partition web; and

B. an elongated retainer member of an elastomeric material impregnated with magnetized material, having opposite straight and parallel side edges and having a transverse cross-section which is uniform along its length, with

(1) a substantially flat bottom surface,

(2) a substantially upwardly facing surface area that is spaced laterally inwardly from each of said side edges, and

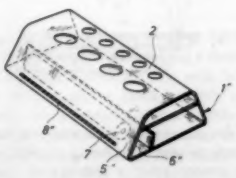
(3) a pair of retaining flanges that project edgewise laterally toward one another over said surface area, each of which closely overlies one of said supporting flanges to confine it against said surface area, said retaining flanges having adjacent free edges that are spaced apart to receive between them said partition web of the divider member.

4,488,654

STAND FOR SUPPORTING SUBSTANTIALLY CONICAL OBJECTS AS WELL AS A CARRIER PREFERABLY FOR USE IN CONNECTION WITH THIS STAND

Peter Odsgard, Glostrup, Denmark, assignor to Odsgard Reklame/Marketing ApS, Glostrup, Denmark

PCT No. PCT/DK82/00025, § 371 Date Nov. 23, 1982, § 102(e) Date Nov. 23, 1982, PCT Pub. No. WO82/03373, PCT Pub. Date Oct. 14, 1982
PCT Filed Mar. 25, 1982, Ser. No. 444,595
Int. Cl.³ B65H 19/00
U.S. Cl. 312—39 **15 Claims**



1. A stand for supporting substantially conical objects such as ice-cream cones or disposable cups, and comprising an upper dispensing plate with a plurality of apertures in which the objects may be situated, said upper dispensing plate includ-

ing side plates, characterized in that said stand farther includes a container for carriers, said carriers provided with apertures for carrying the conical objects, said container adapted to dispense the carriers one by one with the carriers situated on the dispensing plate of the stand before the conical objects are situated on the stand, said container mounted below the dispensing plate in such a manner that the distance between the top side of the container and the underside of the dispensing plate is greater than the distance which the conical objects project below said dispensing plate, and at least one slot in said side plate for the removal of the carriers.

4,488,655

PLASTIC CLOSURE FOR CONTAINERS

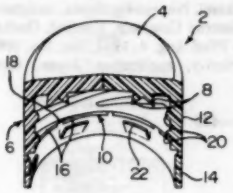
Junichi Itsubo, and Hiroyuki Oda, both of Hiratsuka, Japan, assignors to Japan Crown Cork Co., Ltd., Tokyo, Japan

Filed May 25, 1982, Ser. No. 382,053

Claims priority, application Japan, Mar. 15, 1982, 57-35209[U]

Int. Cl.³ B65D *41/34*

U.S. Cl. 215—252 **7 Claims**



1. For use in a container including a mouth-neck portion having formed on its peripheral surface an external thread and an annular flange located beneath it, a pilfer-proof plastic closure comprising a top panel wall and a cylindrical skirt wall extending downwardly from the peripheral edge of the top panel wall, said skirt wall having a breakable line extending circumferentially to divide it into a main portion above the breakable line and a pilfer-proof bottom portion below it, and the inner surface of said main portion having formed therein an internal thread adapted to be fitted with the external thread of the mouth-neck portion of the container, the inner surface of the pilfer-proof bottom portion having connected thereto at least one flap extending therefrom radially inwardly, said flap being able to pass over the annular flange of the container by being elastically bent when mounting the closure on the mouth-neck portion of the container, and when the closure has been fully fitted with the mouth-neck portion of the container, the flap which has passed over the annular flange returning elastically to its original state and its upper edge engaging the lower surface of the annular flange, said flap increasing progressively in thickness from its lower edge to its upper edge, and the thickness of its upper edge is about 0.5 to about 3 mm.

4,488,656

STOPPER FOR VIALS

Hisatomi Fukuoka, Kitakatsuragi, and Hisami Yamaguchi, Nishinomiya, both of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Jun. 2, 1983, Ser. No. 500,570

Claims priority, application Japan, Jun. 25, 1982, 57-110393

Int. Cl.³ B65D *51/16*

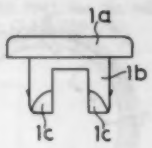
U.S. Cl. 215—307 **4 Claims**

1. A stopper for a vial, comprising:

a top portion;

an annular element extending from said top portion, said annular element having a cylindrical radially outer surface, a cylindrical radially inner surface, a longitudinal axis common to both said outer and inner surfaces, one end fixed to said top portion and a distal end opposite said one end;

a slot in said annular element, said slot formed by two parallel planar surfaces extending parallel to said longitudinal axis, each said parallel surface extending to said distal end, intersecting said inner surface and intersecting said outer surface at two points, whereby said annular element is divided into two legs by said slot, each said leg having a



first circumferential width and circumferential ends defined by an intersection of said slot and said outer surface; and

two cut outs in each said leg, each said cut out being positioned only at an intersection of one said circumferential end and said distal end and defining a surface which intersects said outer surface, one said slot surface and said distal end, wherein said distal end has a circumferential width less than said first width end.

4,488,657

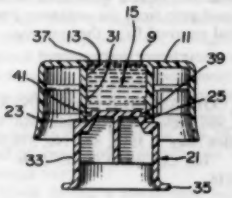
WATER COOLER BOTTLE CLOSURE

Francois Deland, 250 Montigny, Mont St-Hilaire, Québec, Canada J3H 2L9

Continuation-in-part of Ser. No. 428,396, Sep. 29, 1982,. This application Mar. 29, 1983, Ser. No. 480,107

Int. Cl.³ B65D *47/14*

U.S. Cl. 215—303 **5 Claims**



1. A water cooler bottle closure comprising:

a closure cap adapted to fit over the neck of a water cooler bottle,

said closure cap having an opening formed at the bottom thereof,

a continuous wall projecting around the peripery of said opening to define an inner chamber which is associated with said closure cap and is adapted to fit inside the neck portion of the water cooler bottle, said inner chamber having a bottom end at the level of the bottom of said closure cap and a top at the other end of said inner chamber,

said continuous wall being set back with respect to said opening to define a flange,

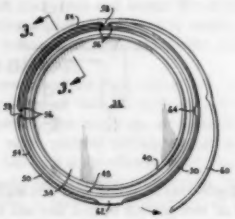
a base including first means formed in said base and engageable by said flange to imperviously close the bottom end of said chamber, and second means different from said first means and formed in said base to enable said base to fit snugly at the top of said inner chamber, so that when said base is mounted at the top of said inner chamber, said base enables the formation of an ice plug in said inner chamber when said inner chamber has been filled with water and said water has been subjected to freezing conditions.

4,488,658

TAMPER EVIDENT FOOD PACKAGE

Ernest L. Smith, Kansas City, Mo., and Donald L. Kraft, Lenexa, Kans., assignors to Sealright Co, Inc., Kansas City, Mo.

Filed Dec. 12, 1983, Ser. No. 560,325
Int. Cl.³ B65D 17/40
U.S. Cl. 220—276 **12 Claims**



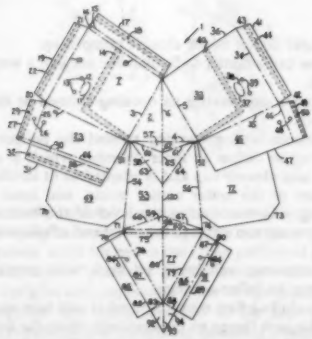
1. A tamper evident closure for a food container having a sidewall terminating in an outwardly extending rim, said closure comprising:
- a lid having a size to cover the container and a periphery disposed in contact with the container sidewall when said lid is applied to the container;
- cooperating means on said periphery of the lid and the container sidewall for releasably holding said lid on the container to enclose the contents of the container; and
- a detachable strip on said periphery of the lid connected therewith along a line of detachment defined by a plurality of cuts arranged generally end to end and separated by a plurality of frangible webs located between adjacent ends of said cuts, said strip at least partially underlying the container rim to secure said lid thereon,
- whereby at least one of said webs must be broken to permit release of said strip from the container rim to release said lid for initial removal from the container.

4,488,659

COLLAPSIBLE CONTAINER

Gary L. Jones, 906 Melody La., Neosho, Mo. 64850

Filed May 3, 1982, Ser. No. 374,482
Int. Cl.³ B65D 90/02, 5/44
U.S. Cl. 220—416 **19 Claims**



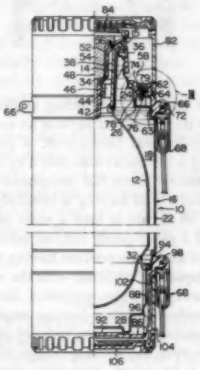
1. A collapsible container cut and folded from a single blank of corrugated paperboard or the like, comprising:
- a triangular bottom panel having a fold line;
- a plurality of exterior side panels foldably attached to said triangular bottom panel;
- a quadrilateral interior back panel foldably attached to said triangular bottom panel and having an intermediate fold line intersecting said fold line of said triangular bottom panel;
- a plurality of interior side panels foldably attached to said quadrilateral interior back panel and positioned on interior sides of said exterior side panels; and
- a lid foldably attached to said quadrilateral interior back panel along a top line,
- wherein said quadrilateral back portion includes a plurality of triangular arrangements of fold lines including a first triangular arrangement having a first base coincident with said top line and a first vertex lying on said intermediate fold line, a second triangular arrangement having a second base coincident with said bottom line and a second vertex lying said intermediate fold line, and a third triangular arrangement having a base coincident with said bottom line and a third vertex lying on said intermediate fold line between said first vertex and said second vertex.

4,488,660

VACUUM BOTTLE

Morio Murakami, Neyagawa, Japan, assignor to Tiger Vacuum Bottle Industrial Company, Limited, Osaka, Japan

Filed Aug. 4, 1982, Ser. No. 405,086
Claims priority, application Japan, Oct. 12, 1981, 56-152294[U]
Int. Cl.³ A47J 41/02
U.S. Cl. 220—425 **28 Claims**



1. A vacuum bottle comprising;
- a tubular body including an inner member in the form of a container having an opening through which contents are adapted to be filled in and poured out of said inner member, and a metallic outer member sealingly associated with said inner member and cooperating therewith to define therebetween a vacuum space, said outer member having a tubular portion and a reduced diameter portion located adjacent to said opening and connected to said tubular portion to define a shoulder between said tubular portion and said reduced diameter portion;
- a shoulder assembly formed of a high molecular material including a main body having an outer peripheral surface and extending around said reduced diameter portion of said outer member so as to cover said shoulder of said outer member, and a thread formed on the outer peripheral surface of said main body;
- a closure associated with said opening as to allow said opening to be opened;
- a cup-like member removably and threadedly engageable with said thread formed on said main body of said shoulder assembly so as to cover said closure;

said inner member being formed of metallic material and said outer member being sealingly secured to said inner member to define therebetween said vacuum space;

said inner and outer members being formed of stainless steel;

preventing means for preventing said shoulder assembly from being relatively rotated to said outer member; and

said preventing means comprising claws secured to said shoulder of said outer member, and claw members engaging with said claws on said shoulder, said claw members being in threaded engagement with said main body of said shoulder assembly.

4,488,661

COMPOSITE PACKING CONTAINER

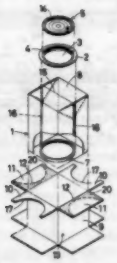
Yoshihiro Homma, Urawa, Japan, assignor to Hokkai Seikan Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1981, Ser. No. 322,274

Claims priority, application Japan, Nov. 26, 1980, 55-168341; Aug. 10, 1981, 56-117685

Int. Cl.³ B65D *90/04*

U.S. Cl. 220—462 **8 Claims**



1. A composite packing container comprising:

an inner container constructed of a synthetic resinous film and including a closed first end;

a ring having a central opening, said ring presenting a substantially flat upwardly facing surface and having a recessed portion on the inner edge thereof surrounding the opening, said ring further including a flange projecting downwardly therefrom;

a closure member detachably mounted in the opening and being disposed within said recessed portion of said ring when in a closed position;

a fastening ring clamp being mounted on an outer circumferential surface of said flange for retaining the closed first end of said inner container therebetween with said inner container forming a temporary closure for said opening in said ring;

an outer container including a box portion for receiving said inner container and a pair of opposing inner flaps connected to an upper peripheral edge of said box for being positioned within a gap formed between said ring and said inner container for supporting the ring and further including a pair of opposing outer flaps connected to the upper peripheral edge of said box for covering said closure member and said inner flaps, mutually facing inner surfaces of said inner and outer flaps being adhered together;

said outer flaps including a removable perforated area conforming to the shape of said closure member;

bottom flaps being connected to a lower peripheral edge of said box;

said inner container including a second end initially open after said first end is retained by said ring, closure member, fastening ring clamp and the inner and outer flaps of said box are affixed relative to each other;

said second end receiving a supply of material and thereafter being sealed;

said bottom flaps being adhered together to form a stackable container after said second end of said inner container is sealed.

4,488,662

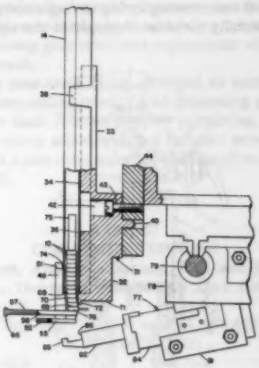
MAGAZINING DEVICE FOR USE WITH AUTOMATIC COMPONENT ASSEMBLING MACHINE

William J. Fanning, Glen Ellyn, Ill., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Nov. 18, 1982, Ser. No. 442,822

Int. Cl.³ B65H *1/00*

U.S. Cl. 221—197 **4 Claims**



1. A fixture for receiving a stack of components to be dispensed by a component extracting member, which comprises:

a receiver block having a vertical passageway therethrough with opposed shoulders projecting into the passageway;

a magazine tube for holding a supply of components, the lower end of said tube resting on said shoulders to permit the components to drop down the passageway;

said receiver block having a horizontal slot in a front section thereof which extends into said passageway, said horizontal slot being positioned below said shoulders;

a tab slidably mounted in said horizontal slot for supporting the components dropped from the end of the magazine tube; said tab having a slot formed therein which extends into said passageway;

said receiver block having a lower back section, opposite said horizontal slot, terminating at a distance from the top surface of said tab, said distance being slightly greater than the thickness of one component, and

said receiver block having a vertical slot in a front section thereof which is aligned with said tab slot, has a length substantially greater than the width of said tab slot, and extends into said passageway for receiving a component pick off member which is adapted to pass through the tab slot to extract a component out of said lower back section of the receiver base.

4,488,663

SELF-CHARGING METERING AND DISPENSING DEVICE FOR FLUIDS

Sonne L. Hooper, Seabrook, and Drel Setzer, Bellaire, both of Tex., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

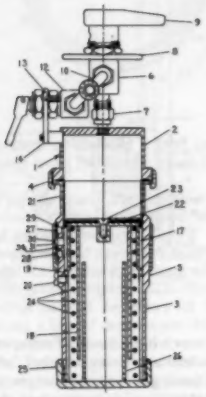
Filed Sep. 28, 1982, Ser. No. 425,205

Int. Cl.³ G01F *11/06*

U.S. Cl. 222—43 **2 Claims**

1. In a self-charging metering and dispensing device for fluids obtained from a pressurized fluid supply comprising, in combination, a closed cylindrical reservoir fitted with at least

one tube and associated valving means permitting the introduction of fluid into the reservoir, the retention of the fluid in the reservoir and subsequent discharge of said fluid from said reservoir, the improvement in said reservoir which comprises a piston in said reservoir disposed to slideably move from the top of said reservoir to a predetermined point below the top of said reservoir, a coil compression spring having a compressive force of less than that exerted by the pressurized fluid supply disposed in said reservoir and coacting with said piston and the bottom region of said reservoir to maintain the piston at the top of the reservoir when empty of fluid and permitting the piston to be displaced downward against the compressive force of the spring with the introduction of fluid from the pressurized fluid supply, the coil compressing spring having a compressive force that is substantially constant throughout the operable move-



ment of the coil compression spring within the reservoir, a rolling elastomer seal to provide a fluid-tight contact between the piston and the wall of the reservoir, means for stopping the downward movement of the piston at predetermined positions of the piston within said reservoir, said means for stopping the downward moveiment comprises, in combination, at least one button slidably disposed through the wall of the reservoir, a rotatable retainer ring affixed to said reservoir and coacting with said button to maintain the button firmly positioned and extending into the reservoir to coact with the piston to stop the downward movement of the piston, said retainer ring containing at least one cavity which when positioned over the button permits the button to be slidably moved into said cavity by coaction with the piston permitting the continued downward movement of the piston.

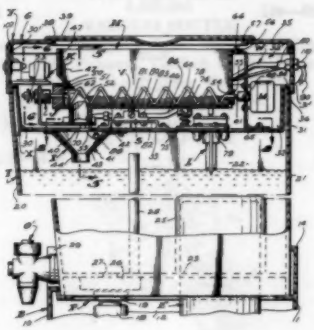
4,488,664

BEVERAGE DISPENSING MACHINE

Robert K. Cleland, 11051 Via El Mercado, Los Alamitos, Calif. 90720

Filed Jan. 12, 1983, Ser. No. 438,051
Int. Cl.³ B67D *5/08*
U.S. Cl. 222—56 **18 Claims**

1. An attachment unit removably engageable with the rim of an upwardly opening liquid supply tank of a beverage dispensing machine and operating to mix together predetermined metered volumes of dry powdered beverage concentrate and water and to deliver a resulting beverage into the tank when the liquid level in the tank lowers to a predetermined low level and until the liquid level in the tank rises to a predetermined high liquid level, said unit includes an elongate vertically extending housing with vertically spaced substantially horizontal top and bottom walls, substantially vertical front, rear and side walls and a tank rim engaging flange about its perimeter, said housing is positioned atop the tank with the flange engaged on the rim of the tank, an elongate substantially horizontally extending and upwardly opening concentrate holding hopper positioned within the housing in spaced relationship with the walls thereof and having an elongate discharge duct communicating with and depending from one end portion thereof, an elongate auger within and extending longitudinally of the hopper, an electric motor within the housing drivingly coupled with the auger and operating to rotate the auger to move concentrate longitudinally in the hopper and into said duct when said motor is energized, a vertically extending mixing chamber at the bottom wall, said chamber has an upper inlet port below said duct to allow concentrate flowing from the duct to flow into the chamber and a lower discharge opening communicating with the tank, water supply means including a pressurized water service system remote from the attachment unit, an elongate nozzle with a discharge end opening into the mixing chamber and disposed to cause water issuing therefrom to mix with concentrate moved from the hopper and into the chamber and having an inlet end, an elongate water



conductor connected with and between the water service system and the inlet end of the nozzle, an electrically operated on and off valve within the housing connected with and operating to start and stop the flow of water through the conductor, and a valving device connected with and operating to control the rate of flow of water through the conductor, a liquid level sensing device carried by the housing and depending into the tank and including low and high liquid level responsive switching devices, a control circuit connected with an electric power source remote from the unit and with said motor, on and off valve and said high and low liquid level responsive switching devices and operating to energize the motor and actuate the on and off valve to an open position when the low liquid level switching device operates in response to a low liquid level in the tank and operating to deenergize the motor and to actuate the on and off valve to a closed position when the high liquid level responsive switching device operates in response to a high liquid level in the tank.

4,488,665

MULTIPLE-OUTLET ADHESIVE APPLICATOR APPARATUS AND METHOD

Eric H. Cocks, Fort Lauderdale, and Richard A. Griffin, Pompano Beach, both of Fla., assignors to Spraymation, Inc., Fort Lauderdale, Fla.

Filed May 24, 1982, Ser. No. 381,519
Int. Cl.³ B67D *5/62*
U.S. Cl. 222—146.5 **9 Claims**

1. Apparatus for dispensing a plurality of coextensive lines or dots of an adhesive comprising:

a housing;

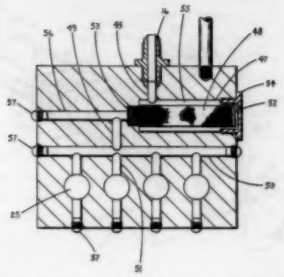
a plurality of adhesive applicators mounted to said housing, each applicator comprising a solenoid coil, an adhesive dispensing module and means connecting said module to

said housing and to said coil for removing and replacing each of said modules as a single unit;

an adhesive inlet flow channel within said housing;

an adhesive distribution flow channel within said housing connected to said inlet flow channel and to each of said plurality of applicators; and,

a filter interposed between said inlet flow channel and said distribution flow channel, said filter comprising a cylindrical fine mesh screen sealingly capped at one end and open at its other end, and means for removing and replacing



said filter without disturbing said inlet and distribution flow channels comprising said open end being removably connected to an outlet flow channel within said housing with said filter fitting within an opening in said housing forming an annulus between said filter opening and said cylindrical screen, said annulus being flow connected to said adhesive inlet flow channel, said outlet flow channel being flow connected to said distribution flow channel, and a cap sealingly and removably connected to said filter opening in said housing.

4,488,666

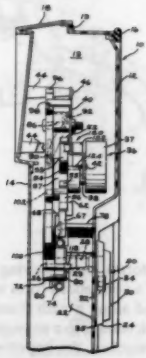
TREATING AGENT DISPENSING APPARATUS FOR A WASHING APPLIANCE

LeRoy J. Herbst, and John L. Preher, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Division of Ser. No. 107,217, Dec. 26, 1979, Pat. No. 4,355,738. This application Dec. 24, 1981, Ser. No. 334,403

Int. Cl.³ B67D *5/08*

U.S. Cl. 222—651 **9 Claims**



1. Dispensing apparatus for dispensing treating agents into the wash chamber of an automatic washing appliance having sequence control means for controlling the sequence of operation of the appliance, said dispensing apparatus comprising:

dispensing means to store and dispense a treating agent;

said dispensing means including a dispensing member adapted to move between a closed position storing the treating agent and an open position enabling dispensing of the treating agent;

a motor and a drive shaft adapted for rotation by said motor;

driving gear means comprising a plurality of driving gear teeth, said driving gear means being coupled to said drive shaft for rotation therewith;

dispensing gear means comprising a plurality of dispensing gear teeth, said dispensing gear means being coupled to said dispensing member for movement of said dispensing member therewith;

biasing means for biasing said dispensing member toward its open position, said biasing means being operative to urge said dispensing gear teeth into engagement with said driving gear teeth;

said driving gear teeth being arranged to successively engage corresponding ones of said dispensing gear teeth as said drive shaft rotates; thereby permitting said biasing means to move said dispensing member toward its open position at a rate determined by the rate of rotation of said drive shaft.

4,488,667

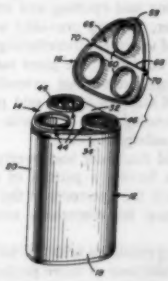
CONDIMENT SHAKER

James B. Swett, Altamonte Springs, Fla., and Erik Herlow, Copenhagen, Denmark, assignors to Dart Industries Inc., Northbrook, Ill.

Filed Mar. 3, 1983, Ser. No. 471,622

Int. Cl.³ B67D *3/00*

U.S. Cl. 222—485 **19 Claims**



1. A shaker for holding and selectively dispensing a condiment or the like through any one of a plurality of discharge ports; said shaker comprising a container having bottom and side walls, and a top wall, said walls defining an internal compartment, said top wall having a plurality of discharge ports therethrough at spaced points thereabout, a cover removably receivable over said top wall, said cover, when received over said top wall, closing the plurality of discharge ports, said cover including a portion thereof alignable with one of said discharge ports and selectively movable relative to the remainder of the cover between a first closed position sealing the aligned discharge port and a second position enabling discharge through the aligned discharge port, said cover being receivable over said top wall in any of a plurality of positions, the selectively movable portion of the cover aligning with one of said discharge ports in any of said plurality of positions of said cover, said top wall is of an equilateral configuration, said cover being of a configuration complementary to the top wall for reception thereover, each discharge port includes an upwardly directed collar peripherally thereabout, said cover including sealing rings depending therefrom and receivable in sealing engagement, one with each of said discharge ports, one of said sealing rings depending from the selectively movable

portion of the cover for sealing engagement with the aligned discharge port in the closed position of said movable portion.

4,488,668

TWO-PIECE SIFTER CLOSURE FOR FILLABLE CONTAINER

Joseph M. Flaska, Somerville, and Robert F. Wittemann, Belle Mead, both of N.J., assignors to Johnson & Johnson Baby Products, New Brunswick, N.J.

Filed Sep. 14, 1982, Ser. No. 417,950
Int. Cl.³ B65D *47/00*
U.S. Cl. 222—548 **11 Claims**

1. In combination, a container having a fillable opening and a two-piece closure for said fillable opening comprising:

an outer cap overlying said opening and rotatably engaged upon said container, said cap provided with a closed top having a pattern of apertures therethrough for dispensing contents from the container; the inner surface of said top having one or more projections extending toward said fillable opening of said container, said projections comprising a post extending from the inside of said cap and terminating in an enlarged portion;

a disk, affixed to said container and overlying said fillable opening, said disk having a pattern of apertures therethrough with which the apertures in the cap may be rotated into alignment for dispensing contents from the container;

said disk further being provided with one or more slots, each engaging each of said one or more projections, said slots having a varying width, decreasing from one end to the other and said enlarged portion of said posts having a width greater than the width of the narrowest part of the slots; and

means provided for limiting the cap rotation and the travel of said projections within said slots;

said projections and said slots being positioned so that a first extreme limit of travel of a projection within a slot, the apertures in said cap align with the apertures in said disk to allow dispensing of contents of the container whereas at a second extreme limit of travel of a projection within a slot said apertures in said cap are misaligned with said apertures in said disk to prevent dispensing of said contents.

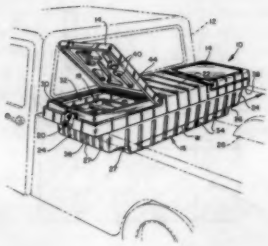
4,488,669

TRUCK TOOL BOX

John E. Waters, 8504 Gladedale Dr., Waco, Tex. 76710

Filed Jul. 25, 1983, Ser. No. 516,775
Int. Cl.³ B65D *43/16*
U.S. Cl. 224—273 **15 Claims**

1. A nonmetallic container adapted for use as a cross-bed tool or utility box in a pickup truck, said container adapted to be supported by the upper surfaces of the side panels of a pickup truck and to bridge the space therebetween without intermediate support; said container comprising a unitarily molded polymeric body portion further comprising integrally formed bottom, side and end wall portions, an upwardly directed opening at each end of said body portion to provide access to the interior thereof, and an integrally formed central portion spanning the side walls between said openings; lid means disposed over each of said openings, said lid means being pivotally connected to said body portion by recessed hinge assemblies disposed at either side thereof so as to permit



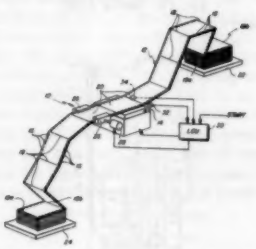
said lid means to cover said openings when in a lowered position and to provide access to said openings when in an upwardly inclined position, said lid means and said body portion being further adapted to provide sealing engagement therebetween when said lid means is in said lower position, and said lid means being pivotally connected to said body portion in such manner that when said lid means is in said lower position, the top of said lid means and said integrally formed central portion of said body portion cooperate to provide a substantially horizontal surface spanning the top of said container.

4,488,670

CONTINUOUS FORM FEEDER

Russell L. Godshalk, Spencerport; Richard L. Bray, Churchville, and Lawrence M. Wood, Spencerport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 7, 1983, Ser. No. 464,292
Int. Cl.³ B65H *25/24*
U.S. Cl. 226—10 **6 Claims**



1. In a continuous forms feeder having means for engaging seriatim the panels of a continuous form to move the panels at a predetermined speed along a path from a stack in a supply station through a work station to a storage station in which the continuous form is restacked, the improvement comprising:

means for counting the panels of the continuous forms; and

means responsive to said panel counting means and operatively associated with said engaging means for reducing the speed of panel movement below said predetermined speed during the movement of the first several panels of the continuous forms through said work station to provide

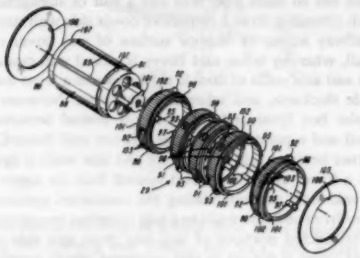
more time for effecting proper restacking in the storage station.

4,488,671

LABELER

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Apr. 12, 1983, Ser. No. 484,349
Int. Cl.³ B65C *11/00*; G03B *1/24*
U.S. Cl. 226—79 **4 Claims**



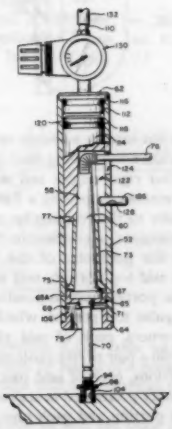
1. A feed wheel adapted to advance a web, the feed wheel including a hub, means including feed teeth selectively coupled to the hub for providing a selected feed tooth pattern, wherein the means providing a selected feed tooth pattern includes a plurality of rings, each ring having at least one of said feed teeth, means for coupling each ring in a selected position on the hub, wherein the hub includes at least one axially extending groove, each ring having a projection extending into and keyed in the groove, wherein the rings are adapted to be slid axially onto the hub in oriented relationship.

4,488,672

THERMAL PRESS HAVING INSERT DRIVING AIR BIASING MECHANISM

James M. Faucher, Worcester, Mass., assignor to C.E.M. Co., Inc., Danielson, Conn.

Filed Aug. 4, 1982, Ser. No. 405,044
Int. Cl.³ B27F *4/00*
U.S. Cl. 227—156 **16 Claims**



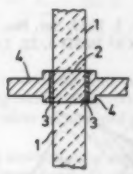
1. A press for installing metal inserts into a workpiece of thermoplastics material and comprising a frame, a driver mounted on the frame for reciprocation toward and away from the thermoplastics workpiece, throw limit positioning means on the frame for establishing a starting position for the driver and a ready operative position for the driver, the starting position for the driver being remotely spaced relative to the workpiece and the ready operative position for the driver being adjacent the workpiece, a bit supported by the driver for reciprocation toward and away from the workpiece, heating means for the bit, the bit being engageable with an insert upon movement of the driver from starting position to said ready operative position for applying heat directly to the insert causing it to locally melt the thermoplastic workpiece, the driver further including a stop member for limiting movement of the bit and an air biasing drive system for moving the bit to an extent limited by the stop member, the air biasing drive system operating to move the bit independently of the driver when the driver is in a stationary condition in its said ready operative position, the throw limit positioning means maintaining the driver in stationary condition in its said ready operative position during such bit movement, the air biasing drive system including adjustable pressure regulating means to apply a preselected substantially constant insert driving force on the bit to advance the insert into the workpiece upon softening of its thermoplastics material responsive to bit movement relative to the driver in its said ready operative position.

4,488,673

DIRECT METAL BRAZING TO CERMET FEEDTHROUGHS

Albert C. Hopper, Jr., St. Petersburg, Fla., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 29, 1982, Ser. No. 403,219
Int. Cl.³ B23K *1/12*
U.S. Cl. 228—122 **8 Claims**



1. In a method of brazing a metal component to an exposed outer surface of a cermet via in an alumina substrate, which comprises (a) cleaning the cermet via surface to be brazed, (b) applying a metallized layer. and (c) brazing a metal component to the metallized area,

the improvement wherein,

step (b) consists essentially of applying a nickel layer over the cermet via surface but substantially not beyond said surface onto the alumina substrate.

4,488,674

BONDING WIRE, SEMICONDUCTOR DEVICE HAVING THE SAME, AND BONDING METHOD USING THE SAME

Hideharu Egawa, Tokyo, and Katsuya Okumura, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

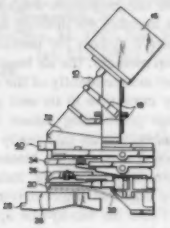
Filed Sep. 24, 1982, Ser. No. 423,283
Claims priority, application Japan, Oct. 12, 1981, 56-162197
Int. Cl.³ H01L *21/60*
U.S. Cl. 228—179 **5 Claims**

1. A method for connecting a bonding pad to a lead frame of a semiconductor device through a bonding wire, comprising the steps of:

providing a bonding wire which has a core wire made of a metal and an insulating film which surrounds said core wire, said insulating film being made of a flexible resin

which is thermally stable at temperatures below 200° C., and which thermally decomposes and scatters at a temperature of 200° to 300° C.;

thermally decomposing and scattering one end portion of said insulating film of said bonding wire and thereafter bonding the one end portion of said core wire which is



exposed to said bonding pad by a nail head bonding method; and

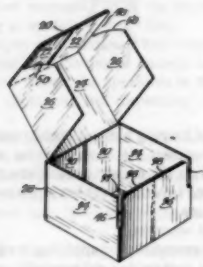
thermally decomposing and scattering the other end portion of said insulating film of said bonding wire and thereafter bonding the other end portion of said core wire which is exposed to said lead frame by a nail head bonding method.

4,488,675

ONE PIECE INTERLOCKING OUTFOLD CONTAINER

Lawrence A. von Gnechten, Mosinee; Thomas E. Byrnes, Adams, and John C. Lasky, Wisconsin Rapids, all of Wis., assignors to Consolidated Papers, Inc., Wisconsin Rapids, Wis.

Filed Apr. 1, 1983, Ser. No. 481,294
Int. Cl.³ B65D *5/22, 5/66*
U.S. Cl. 229—33 **6 Claims**



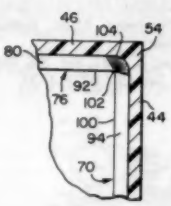
1. An outfold container, comprising a one piece cutout of a sheet of corrugated material forming a rectangular box and a cover for said body, said rectangular box having a bottom wall, a front wall, a back wall, a pair of side walls and an open upper end, said back wall including at least two thicknesses of said corrugated material, said cover having a rectangular top wall hingedly connected along a back edge thereof with an upper edge of said box back wall, a pair of side walls connected to opposite side edges of said top wall and extending perpendicular therefrom and a front wall connected to a front edge of said top wall and to side edges of said cover side walls and extending perpendicular therefrom, said cover being pivotable between a container open position away from said open upper end of said box and a container closed position whereat said cover side walls extend across and to the interior of respective ones of said box side walls, said cover front wall extends across and to the exterior of said box front wall and said cover top wall extends across and closes said open upper end of said box, said cover and box front and side walls having substantially the same height, whereby when said cover is closed, front, back and side walls of said container are each of at least two thicknesses of corrugated material and said container has increased stacking strength, wherein said box back wall has an outer back wall and two strengthening flaps each extending from a respective side wall substantially halfway across an interior surface of said outer back wall, said box front wall has an outer front wall and a pair of strengthening flaps each extending from a respective box side wall substantially halfway across an interior surface of said box outer front wall, and said cover front wall has an outer fron wall and a pair of strengthening flaps each extending from a respective cover side wall substantially halfway across an interior surface of said cover outer front wall, whereby when said cover is closed said container has back and side walls of double thickness and a front wall of quadruple thickness, and wherein each corner between said rectangular box front and side walls is slotted between an upper end and a point spaced from a lower end thereof, and each corner between said cover front and side walls is opened between a lower end and a point spaced from an upper end thereof, said slots accommodating the connected portions of said cover front and side walls and said openings accommodating the connected portions of said box front and side walls when said cover is moved to said container closed position.

4,488,676

CONTAINER LID

Douglas S. Halliday, Whittier, Calif., assignor to Tri-Plas Inc., Ontario, Calif.

Filed Jul. 19, 1983, Ser. No. 515,182
Int. Cl.³ B65D *43/10, 51/16*
U.S. Cl. 229—43 **11 Claims**



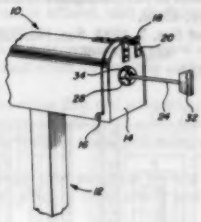
1. Closure means for sealing a container with a rectangular cross-sectional configuration having four parallel sides which intersect to form four right angles and smooth exterior side walls, said closure means comprising a flat top portion corresponding substantially to the rectangular cross-sectional configuration of the container, a continuous skirt portion joined perpendicularly to the perimeter of the top portion which extends away from said top portion, said skirt portion including four planar side portions corresponding in length to the sides of the rectangular top portion which intersect to form four right angle corners, each of said planar side portions having formed therein a pair of ribs projecting outwardly from said planar side portions, each of said pair of ribs being separated by a discontinuity positioned in approximately the center of each planar side portion and each one of said pair of ribs intersecting at said corners with a rib in an adjacent planar side portion, each of said corners formed by the intersection of said planar side portions including corner reinforcing means for providing stability to said corners and causing said closure means to grip the corners of said rectangular container securely when said closure means is applied to said container.

4,488,677

MAILBOX CONSTRUCTION

Arnold R. Guest, Sr., 1612 Huntington Dr., NW., Marietta, Ga. 30066

Filed May 11, 1983, Ser. No. 493,508
Int. Cl.³ B65D 91/00
U.S. Cl. 232—34 4 Claims



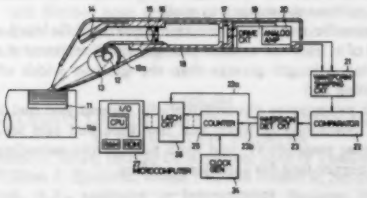
1. A mailbox having an access door, door-operating handle means for opening and closing the door, and means for enabling the handle means to indicate alternative mail conditions of the box, wherein the enabling means includes mounting means attaching the handle means to the door for movement between a first position indicating mail is to be collected from the box and a second position indicating that mail has been collected and/or delivered, wherein the handle means comprises an indicator plate and the mounting means includes means for orienting said plate vertically in one of said positions and horizontally in the other of said positions, and wherein the plate is mounted at one end of an elongate rod, and the other end of the rod is connected to the door by a ball and socket connection allowing the rod to swivel about its longitudinal axis to move the plate between said positions.

4,488,678

METHOD AND APPARATUS FOR READING A BAR CODE

Masahiro Hara, Kariya; Atsutoshi Okamoto, Aichi, and Toshiyasu Sakai, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 3, 1982, Ser. No. 384,749
Claims priority, application Japan, Jun. 11, 1981, 56-90629
Int. Cl.³ G06K 7/14
U.S. Cl. 235—463 11 Claims



1. A method of reading a bar code having parallel bars indicative of information, by means of a reader having a sensor for converting an image into an electrical signal; comprising the steps of:

(a) detecting a portion of said bar code for obtaining first data including width information of bars at one end of said bar code;

(b) storing said first data;

(c) detecting another portion of said bar code for obtaining second data including width information of bars at the other end of said bar code;

(d) storing said second data;

(e) obtaining the number of bars included in said first data, and also the number of bars included in said second data;

(f) obtaining a total number of bars of said first and second data;

(g) comparing said number with a predetermined number;

(h) removing superfluous data from said first and/or second data so that said total number equals said predetermined number; and

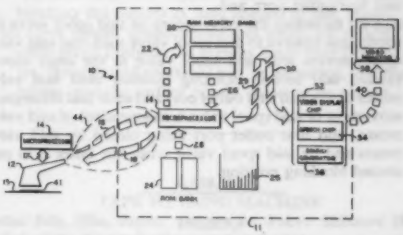
(i) combining said first and second data, from which said superfluous data has been removed, to obtain resultant data indicative of the entire information of said bar code.

4,488,679

CODE AND READING SYSTEM

Karlheinz H. Bockholt, Delavan, and John F. Harris, III, Franksville, both of Wis., assignors to Western Publishing Company, Inc., Racine, Wis.

Filed Nov. 1, 1982, Ser. No. 437,928
Int. Cl.³ G06K 7/12
U.S. Cl. 235—469 15 Claims



1. In combination, a code and code reading system:

said code comprising some 200 by 200 dots printed in at least five contrasting colors on a record medium in at least one data field:

said reading system comprising a scanning head adapted to be immoveably placed over and overlay said entire at least one data field, with no relative movement between said scanning head and said at least one data field as it is read:

said scanning head including activating means and means for sequentially flashing light upon said entire at least one data field to sequentially obtain data from said 200×200 dots printed thereon in said five contrasting colors;

said sequentially obtained data being recorded on an image recording means held in said scanner head;

means to feed said recorded image data to a random access memory (RAM) of a microprocessor to form a replica of said entire data field read and the distribution of the contrasting color dots printed therein, said replica of said data field being stored in said RAM until a predetermined number of sequential scans have been completed; and

decoding means in said microprocessor whereby said replica of said field in said RAM may be manipulated to perform assigned functions.

4,488,680

THERMALLY RESPONSIVE VALVE DEVICE

Kouichi Itoh, Chita, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 8, 1983, Ser. No. 472,876
Claims priority, application Japan, Mar. 31, 1982, 57-45903
Int. Cl.³ G05D 23/12
U.S. Cl. 236—93 A 14 Claims

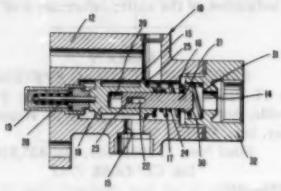
1. A thermally responsive valve device comprising:

a body having an inlet port and first and second outlet ports;

a spool valve slidaly mounted within said body and having land means fixed thereon, said spool valve being dispos-

able in a first blocking position wherein said land means blocks communication between said inlet port and said second outlet port, and in a second blocking position wherein said land means blocks communication between said inlet port and said first outlet port, said spool valve also having a valve portion for selectively connecting said inlet port to said second outlet port when said land means is out of said first blocking position;

temperature responsive means operably connected to said spool valve for causing said spool valve to move in response to changes in temperatures;



valve means for controlling fluid communication through said first outlet port; and

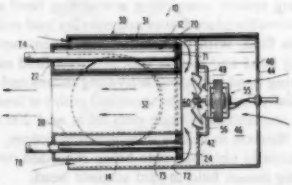
means for mounting the valve means on said spool valve for movement relative to said spool valve such that said valve means moves with said spool valve as the latter moves toward said second blocking position until said valve means closes said first outlet port and such that subsequent movement of said spool valve is independent of said valve means, said first outlet port being closed by said valve means and by said spool valve when the latter is in said second blocking position.

4,488,681

HEAT SAVING DEVICE

Donald A. Lindsey, Rte. 7, Box 7095-C, Nampa, Id. 83651

Filed Jun. 20, 1983, Ser. No. 505,850
Int. Cl.³ F24B *7/00*
U.S. Cl. 237—55 **4 Claims**



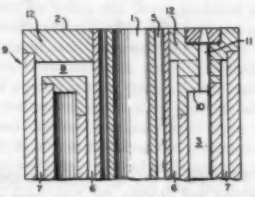
1. A heat saving device for use in conjuction with the flue pipe of a stove, furnace or similar heater comprising: a chamber carried on said flue pipe including an outer wall having openings for passage of hot combustion products through the chamber, end walls each having an opening, an inner tube supported in the openings in said end walls and forming the inner wall of the chamber, thereby providing for the passage of air through said tube in heat exchanging relationship with the hot combustion products in the chamber, a shroud open at both ends partially surrounding the outer wall of said chamber and being supported in spaced relationship to said wall, said shroud having a section extending beyond one of the end walls of the chamber, a baffle plate provided in the section of the shroud extending beyond the end wall of the hot combustion products chamber, said baffle plate dividing the interior of said shroud into first and second shroud chambers, the first shroud chamber for receiving air directly from outside the shroud and the second shroud chamber for receiving preheated air entering the shroud through the space formed between the shroud and the hot combustion products chamber, said baffle plate having an opening therein in alignment with the inner tube, and a fan mounted in the opening in the baffle plate for causing the air in both shroud chambers to flow through the inner tube in heat exchanging relationship with the hot combustion products.

4,488,682

COOLING SYSTEM FOR POST-MIXED BURNER

Hisashi Kobayashi, Putnam Valley, and William J. Snyder, White Plains, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 7, 1983, Ser. No. 529,993
Int. Cl.³ B05D *15/00*
U.S. Cl. 239—132.3 **6 Claims**



1. A burner comprising:

(a) a fuel tube having its discharge end at the burner face;

(b) an annular oxidant passageway circumferentially around said fuel tube and axially along said fuel tube to a point short of the burner face so as to define a space between said point and the burner face;

(c) a plurality of oxidant passages passing through said defined space, connected to and communicating with said annular oxidant passageway at said point and having their discharge end at the burner face;

(d) a second annular passageway circumferentially around said fuel tube and extending axially along said fuel tube into said defined space, adapted for flow for cooling fluid and positioned between said fuel tube an said annular oxidant passageway;

(e) a third passageway circumferentially around both said fuel tube and said oxidant passageway, extending into said defined space and adapted for flow of cooling fluid;

(f) at least one connecting conduit, connecting said second and third annular passageways at their respective points most proximate the burner face, in said defined space;

(d) a thick solid portion between the burner face and said connecting conduit(s), having a thickness sufficient to provide a seat to accomodate a directional removable nozzle, said thickness being at least twice the thickness of the outermost passageway wall;

(h) a metallic removable directional nozzle at the discharge end of at least one oxidant passage, said directional nozzle having a length greater than the greatest width of its opening and

a forth passageway circumferentially around said fuel tube and positioned between said fuel tube and said second annular passageway, said forth passageway extending to the burner face for supplying oxidant.

4,488,683

SELF-PROPELLED IRRIGATION EQUIPMENT

David Chiel, Afula, Israel, assignor to Metal Works Ramat David, Israel

Filed Sep. 8, 1981, Ser. No. 300,209
Claims priority, application Israel, Sep. 9, 1980, 61002
Int. Cl.³ B05B *3/18*
U.S. Cl. 239—199 **2 Claims**

1. Self-propelled irrigation equipment for irrigating large planted areas, comprising:

a vehicle provided with a frame and with two free rear

wheels on a common axle and with one driving front swivel wheel,

swivelling support means supporting said driving wheel for swivelling motion with respect to the frame,

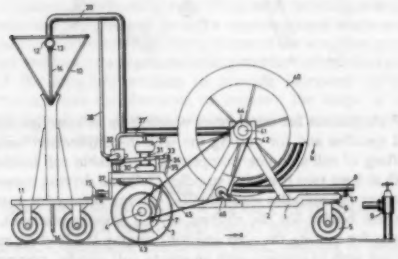
first hydraulic actuator means mounted on said swivelling support means and connected to said driving wheel for rotating said driving wheel;

a drum positioned on said vehicle having a hollow support shaft extending generally parallel to said common axle to which the drum is affixed, said shaft having at least one hollow end portion;

second hydraulic actuator means mounted on said frame and connected to said drum for rotating said drum and hollow support shaft;

a flexible hose having a first end adapted to be connected to a stationary water supply point and a second end fastened to said hollow shaft in communication with said hollow end portion;

a water distribution pipe mounted on and extending transversely to both sides of said vehicle and provided with a



plurality of water outlets each having one end of a trailing hose connected thereto, the other ends of the trailing hoses being are open to emit water adjacent to the ground;

first pipe means connecting said hollow shaft portion with said distribution pipe for communicating water thereto;

second pipe means for supplying water from the first pipe means to the first hydraulic actuator means to rotate the driving wheel;

means associated with the first pipe means for controlling the rotation of said driving wheel for moving said vehicle at a velocity generally proportional to the quantity of water flowing through said first pipe means to said distribution pipe;

third pipe means for supplying water from the first pipe means to the second hydraulic actuator means to rotate the drum; and

means for controlling the rotation of said drum for winding said flexible hose upon said drum in several layers at a speed which is dependent on the resistance exerted by the hose to the drum rotation.

4,488,684

PRECISION LIQUID COATING APPARATUS FOR AN ELECTROLYTIC PRINTER

William S. Ebert; Harold D. Reynolds, both of Endicott, N.Y.; William J. Sjostrom, Rome, Pa., and Robert R. Strollo, Endicott, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

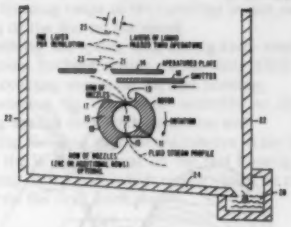
Filed Dec. 29, 1982, Ser. No. 454,304
Int. Cl.³ B05B *3/02*
U.S. Cl. 239—222 **9 Claims**

1. Apparatus for wetting the surface of an object with predetermined amounts of fluid to thereby render it amenable to a future operation to be performed thereon, said apparatus comprising:

(a) a source of fluid;

(b) a cylindrical rotor having a hollow center and a shaped surface portion for causing a partial vacuum thereabove when said rotor is rotated, said shaped surface portion having at least one row of apertures therein, said apertures forming a path from said rotor center to said shaped surface portion of said rotor,

(c) conduit means, connected between said liquid source and said rotor center, for conveying fluid from said source thereof to said rotor center;



(d) shutter means, adjustably mounted between said row of apertures and said object to be wetted, for selectively blocking the amount of fluid applied to said object; and

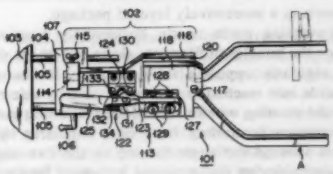
(e) drive means, connected to said rotor, for rotating said rotor when energized to thereby force fluid from its center, through said apertures and, as permitted, said shutter means onto the surface of said object to be wetted.

4,488,685

TAPE WINDING MACHINE

Tetuo Iida, Mie, Japan, assignor to Tokyo Shibaura Denki Kabushiki, Kawasaki, Japan

Filed Sep. 13, 1982, Ser. No. 417,634
Claims priority, application Japan, Sep. 14, 1981, 56-136451
Int. Cl.³ H01F *41/08*; B65H *81/02*
U.S. Cl. 242—4 BE **16 Claims**



1. A machine for winding tape on a formed coil having spaced loop portions comprising:

a bed;

a tape winding unit provided on said bed and including a tape reel on which an electrically insulating tape is wound and a rotatable taping ring having a notch and carrying said tape reel; and

a coil support unit provided on said bed and having a pair of support heads aligned with each other and means for adjusting the distance between support heads, and clamp means carried by each of said support heads for clamping the loop portions of a formed coil, means for mounting said clamp means for level adjustment and rotation about a horizontal axis,

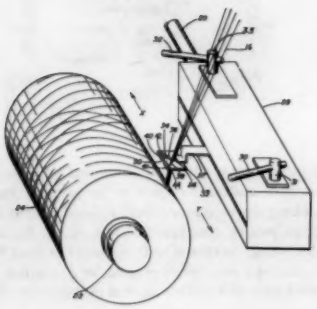
wherein said clamp means each includes a plate-like coil receiving element and a plate-like coil pressing member for clamping said loop portion of said formed coil and means for positioning said loop portion of said formed coil, wherein said positioning means is a pin projecting from said coil receiving element.

4,488,686

APPARATUS AND METHOD FOR PACKAGING A PLURALITY OF FILAMENTS OR BUNDLES OF FILAMENTS

Walter J. Reese, North Huntington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 10, 1983, Ser. No. 456,886
Int. Cl.³ B65H 54/08, 55/00
U.S. Cl. 242—18 G 20 Claims



1. An apparatus for producing and collecting a plurality of bundles of filaments, comprising:

(a) means for forming a plurality of continuous filaments from a supply,

(b) means for gathering the plurality of filaments into more than one bundle of filaments,

(c) a rotatable winder to attenuate and collect the continuous filaments in a successively layered package,

(d) a traversing guide nearly horizontally positioned to engage the bundles of filaments along one or the other of two angularly opposing sides to guide the bundles of filaments into essentially uncrossed, side-by-side relation onto the rotating winder, where the traversing guide has an extension protruding from each angularly opposing side to subtend the angle formed by the two angularly opposing sides so that a corner is formed between each angularly opposing side and the extension protruding from that angularly opposing side, where the two angularly opposing sides with their extensions form a containment area and, where the extensions fail to meet each other to form an opening, and the opening is large enough for placement of the bundles of filaments into the containment area,

(e) means for reciprocating the traverse guide to traverse the bundles of filaments parallel to the axis of rotation of the winder to distribute the bundles of filaments in successive layers on the rotating winder, and

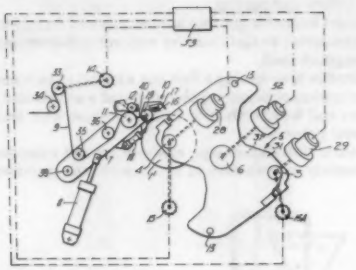
(f) a contacting means positioned nearly in line with each end of the package so that the bundles of filaments around each end of the traverse contact a contacting means as the traverse guide moves partially passed the contacting means at the end of each traverse so that the bundles of filaments are gathered into a group of bundles in the proximate corner of the traverse guide resulting in the traverse guide directing the group of bundles onto the winder around each end portion of the layers of the package.

4,488,687

METHOD AND ARRANGEMENT FOR CONTINUOUSLY WINDING-UP A WEB OF MATERIAL

Bengt A. Andreasson, ÅmÅl, Sweden, assignor to Aktiebolaget Amals Mekaniska Verkstad, Sweden

Filed May 12, 1983, Ser. No. 494,059
Claims priority, application Sweden, May 26, 1982, 8203265
Int. Cl.³ B65H 19/20
U.S. Cl. 242—56 A 13 Claims



7. Apparatus for continuous winding-up of material web on roll spindles and for cutting the web in conjunction with the shifting of roll spindles, comprising a rotatable roll holder (5) with at least two rotatable spindles (3,4) and driving means for rotating the spindles individually, driving means for rotating the roll holder for the shifting of roll spindle positions, and means for cutting the web and for bringing the leading end of the cut web to contact with an empty roll spindle, comprising a holder (10) fixedly mounting and carrying thereon for movement therewith at all times a cut-off knife (17), a brush (16) or corresponding member and a combined deflector-, joining- and pressure roller (19) extending over the width of the web (9), said holder (10) being pivotable about a pivot (40), and said holder (10) being provided with said pivot (40), said combined roller (19), said brush or corresponding member and said knife being provided in said order in the direction of the web movement so that said brush or corresponding member is provided on the holder between said combined roller and said knife, said holder (10) pivotally attached through said pivot (40) to a pair of shifting levers (7) which in turn are pivotally mounted in frame end sections (37,38) by means of pivots (39) and the combined roller is oriented relative to the shifting levers such that when the roll (1,1') increases in size the levers (7), in the initial stage of increase in size of said roll, are pressed upwards by the geometric orientation of the roll and the pressure roller (19) so that the brush (16) ceases to make contact with the roll.

4,488,688

COILING APPARATUS FOR LONG-SIZE PRODUCTS

Alexandr V. Trubitsin; Mikhail G. Polyakov; Georgy M. Fomin; Petr I. Denisov; Pavel E. Petrov, and Petr P. Pomelnikov, all of Magnitogorsk, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky Institut Metiznoi Promyshlennosti Vnilmetiz, Magnitogorsk, U.S.S.R.

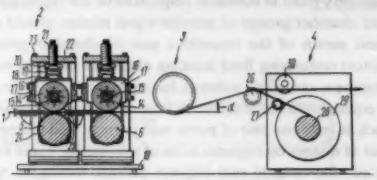
PCT No. PCT/SU80/00122, § 371 Date Mar. 23, 1982, § 102(e) Date Mar. 23, 1982, PCT Pub. No. WO82/00423, PCT Pub. Date Feb. 18, 1982
PCT Filed Jul. 31, 1980, Ser. No. 364,844
Claims priority, application U.S.S.R., Jan. 10, 1978, 2569265
Int. Cl.³ B21C 47/02; B65H 17/20
U.S. Cl. 242—78 9 Claims

1. A coiling apparatus for long-size products, comprising:

means for rectilinearly drawing the long-size products;

means for coiling the long-size products spaced downstream of said drawing means and in the direction of movement of the long-size products;

said means for drawing the long-size products including at least one rotatable drive shaft and at least one rotatable spring-loaded roll having a flat outer peripheral surface with its axis parallel to the axis of said drive shaft and wherebetween the long-size product is passed, a fork for rotatably supporting the spring-loaded roll, and a guide rack receiving said fork for movement toward and away from said drive shaft, said drive shaft including a plurality



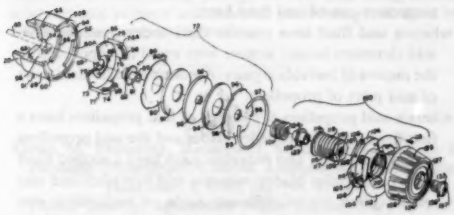
of spaced, peripheral annular flutes each receiving a single long-size product and having a cross-sectional shape conforming to the cross-sectional shape of the long-size product and having a depth exceeding one-half of the thickness of the long-size product to provide increased surface contact area therebetween to maintain the shape of the product during drawing without imposing excessive plastic strains thereon.

4,488,689

METHOD OF ASSEMBLING A DRAG CARTRIDGE IN A REAR MOUNTED DRAG REEL

Richard R. Councilman, Collinsville, Okla., assignor to Brunswick Corporation, Skokie, Ill.

Filed Aug. 9, 1982, Ser. No. 406,539
Int. Cl.³ A01K *89/01, 89/02*
U.S. Cl. 242—84.5 A **1 Claim**



1. In a method of assembling a drag cartridge means in an open faced spinning reel

the reel having a housing with a back end portion, an axially reciprocating center shaft extending through the housing and projecting rearward into a rearward facing cavity on the back end portion; a keyed portion on the center shaft extending into the rearward facing cavity;

a spool carried by a forward portion of the centershaft;

a handcrank;

a rotatably mounted bail support member connected by transmission means to the handcrank to be rotated thereby;

bail means pivotally mounted on the support member to be rotated therewith; the improvement comprising the steps of assembling a drag cartridge means on the housing comprising:

(a) selecting a cartridge means having a particular drag range;

(b) aligning means on the cartridge means with mating means in the cavity;

(c) threading the keyed portion of the centershaft into a mating keyed portion of a drag drive means on the cartridge means;

(d) moving the cartridge means into the cavity with the center shaft and drag drive means keyed together and with the mating aligning means engaged to prevent rotation of the cartridge means relative to the reel housing;

(e) selecting a spring of a particular rating to correspond with the drag range of the cartridge means and the test rating of the line on the spool;

(f) assembling the spring with a drag knob assembly;

(g) aligning latching means on the drag knob assembly with coacting means on the reel housing;

(h) depressing the drag knob assembly to depress the spring against the cartridge means; and

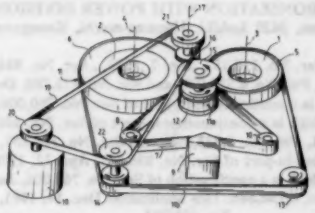
(i) rotating the drag knob means relative to the housing to latch the latching means on the reel housing whereby the drag on the centershaft can be varied by turning the knob on the drag knob means.

4,488,690

CASSETTE WITH CONTROLLED-SPEED ELASTIC BELT

Jean-Pierre Merle, Clamart, France, assignor to Enertec, Montrouge, France

Filed Mar. 10, 1983, Ser. No. 474,073
Claims priority, application France, Mar. 17, 1982, 82 04546
Int. Cl.³ G11B *15/26, 23/06*
U.S. Cl. 242—192 **8 Claims**



1. In a tape transport apparatus of the type for use with a magnetic recorder, and including: a frame; two spools rotatably mounted in a plane and on the frame about two respective parallel axes; a tape wound around at least one of the spools, the tape and the two spools forming two reels connected by an accessible portion of the tape; a floating roller rotatable in the same plane as the reels and substantially tangent to the periphery of each of them; and a taut endless belt, capable of elastic elongation, extending between the floating roller and the reels to define, relative to the floating roller/belt/reel contact points, a first loop around the floating roller and a second loop engaging an arc of the periphery of each of the reels to maintain the tension of the accessible portion of the tape, this second loop extending around at least one return roller rotatably mounted about an axis fixed relative to the frame; the improvement comprising:

drive means for directly driving at least one of the return rollers in the second loop at a peripheral speed slightly greater than the peripheral speed of the floating roller.

4,488,691

TORSO RESTRAINT SYSTEM

Daniel L. Lorch, Holland, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 27, 1982, Ser. No. 453,444
Int. Cl.³ B64D *25/06*
U.S. Cl. 244—151 R **7 Claims**

6. A harness system for restraining a crewman on a seat in an aircraft, comprising:

a pair of back straps, each formed to releasably engage the seat at a point on either side thereof and routed up the back and other either shoulder of the crewman;

a pair of rollers, each connected to respective ones of said back straps adjacent to the chest of the crewman;

a pair of front straps, the opposite ends of each formed to releasably engage the seat at the points, and reeved through respective ones of said rollers; and

release means coupled to both pairs of said front and back straps for disengaging said straps from the seat at said points in a single action.

4,488,692

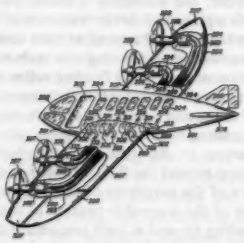
VEHICLE WITH PROPELLER-PAIRS AND AUTOMATIC SYNCHRONIZATION WITH POWER DIVISION

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Division of Ser. No. 110,157, Jan. 7, 1980, , Ser. No. 954,555, Oct. 25, 1978, Pat. No. 4,358,078, and Ser. No. 973,780, Dec. 27, 1978, , which is a continuation-in-part of Ser. No. 760,006, Jan. 17, 1977, , which is a continuation-in-part of Ser. No. 104,676, Mar. 8, 1971, Pat. No. 3,823,898, said Ser. No. 110,157, is a continuation-in-part of Ser. No. 895,687, Apr. 12, 1978, abandoned, which is a continuation of Ser. No. 760,006, Jan. 17, 1977, Pat. No. 4,136,845. This application Dec. 14, 1981, Ser. No. 330,751

Int. Cl.[3] **B64D** *31/00*

U.S. Cl. 244—55 **2 Claims**



1. A fluid-stream driven vehicle, comprising, a body having a medial longitudinal vertical plane; at least one wing extending substantially on both opposite sides of said plane; at least one pair of hydraulic fluid operated motors on portions of said vehicle; at least one pair of fluid stream creating means driven by said motors, respectively, and arranged symmetrically on opposite sides of said medial plane; at least one hydraulic fluid flow producing means having at least one pair of separate fluid-handling chamber groups of equal volumes, at least one pair of separate outlets with each one of said chamber groups connected to one outlet of said outlets, respectively, and including means for fluid-tight separation of the chambers and outlets so that fluid from an individual chamber group passes through one of said outlets only; at least one pair of displacement means associated with said fluid-handling chambers, respectively; equally acting actuator means actuating and defining the displacement volumes of said chambers, respectively, and and cooperating at equal times and in unison with said displacement means for maintaining equal movements of said displacement means so that fluid flows in said outlets at proportionate and equal rates of flow; a pair of delivery passage means connecting said outlets individually with a different one of said motors, respectively; said actuator means permanently fixed in common respective to the respective pair of said chamber groups to provide equal strokes of said displacement means of the respective pair of chamber groups; said motors containing fluid intaking chambers of equal number of chambers and equal volumes for equal numbers of revolutions at equal quantities of intake of flow of fluid; said motors having each at least one pair of ports; said ports of said motors at each pair of motors on opposite sides of said medial plane communicated vice-versa to said delivery passage means for revolving said motors of the respective pair of motors in opposite directions at equal rate of revolutions, whereby said stream-creating means on opposite sides of said medial plane are torque-balanced and driven at equal velocities for producing equal thrusts on both sides of said medial plane to stabilize the movement and attitude of said vehicle;

wherein said at least one pair of fluid stream creating means forms at least two pairs of propellers; one propeller of the same pair mounted symmetrically to the other propeller of the same pair relatively to said body;

wherein each of said propellers is driven by an individual hydraulic fluid motor and each said motor is communicated to an individual fluid line of said delivery passage means respectively, whereby the nunber of individual and separated fluid lines of said passage means are at least equal to the number of said motors;

wherein the number of said chamber groups and of said outlets is equal to the number of said motors and each outlet is singularily and exclusively communicated to a respective one of said fluid lines;

wherein said fluid lines transfer fluid under pressure from said chambers to said motors with equal flow portions to the motors of individual pairs of motors of individual pairs of said pairs of propellers;

wherein said propellers of one pair of said propellers have a first fixed pitch of propeller blades and the said propellers of another pair of said propeller pairs have a second fixed pitch of propeller blades; wherein said first pitch and said second pitch are of different angle of inclination, one thereof having a smaller pitch and the other thereof having a steeper pitch;

wherein one of said propeller pairs is effective at a lower forward speed of the vehicle and the other pair of said propeller pairs is effective at a higher forward speed of the vehicle in the response to said difference of said first and second pitches;

wherein said pressures in said fluid lines to different propeller pairs of said pairs of propellers are different at different foreward speeds of said vehicle, whereby said fluid lines to different propeller-pairs carry different portions of the power obtained from said power plant to different pairs of said propeller pairs, thereby dividing said power into different power portions supplied to different propeller pairs; and,

wherein said power portions vary at different forward speeds of said vehicle to facilite economic operation of said one of said propeller pairs at said lower speed and of the other pair of said propeller pairs at said higher forward speed of said vehicle.

4,488,693

AIRCRAFT HANDLING SYSTEMS

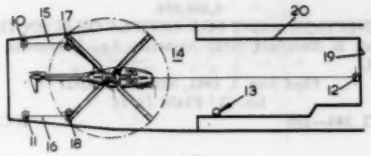
Ulrich Brandt, Hamburg, Fed. Rep. of Germany, and Anthony J. Gray, Midlothian, Scotland, assignors to MacTaggart Scott & Co., Ltd., Scotland

Filed Sep. 8, 1981, Ser. No. 299,923

Claims priority, application United Kingdom, Sep. 5, 1980, 8028800

Int. Cl.³ B64F 1/12

U.S. Cl. 244—116 22 Claims



1. An aircraft handling system for controlling movement of an aircraft on board the deck of a ship or the like to and from a hangar, the deck being maintained free end clear of guide rails and obstructions extending exterior of the hangar, said system comprising primary winch means for effecting movement of an aircraft from a first position on said deck to a second position within said hangar, and secondary restraining means for controlling movement of the aircraft during its passage from said first position to said second position in order to prevent lateral movement or toppling of the aircraft, said secondary restraining means comprising a restraining reel in fixed position on said ship having a wire adapted to be attached to an aircraft at each side thereof during passage of the aircraft from said first position to said second position and each wire being capable of being maintained under substantially constant tension during movement of the aircraft between said positions, the aircraft during passage on said deck being moved solely by said primary winch means while being restrained by said secondary restraining means.

4,488,694

PARACHUTE

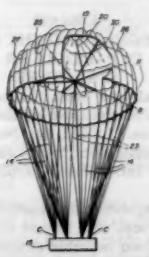
Vivian M. Penberthy, Roodepoort, South Africa, assignor to Paralogic (Proprietary) Limited, Johannesburg, South Africa

Filed Mar. 3, 1983, Ser. No. 471,679

Claims priority, application South Africa, Mar. 9, 1982, 82/1547; Mar. 9, 1982, 82/1548

Int. Cl.³ B64D 17/24

U.S. Cl. 244—152 13 Claims



1. A parachute including a canopy defining a periphery, a connecting arrangement adapted for use in connecting the parachute to a load, a main suspension system comprising a plurality of lines spaced about the periphery of the canopy and secured to the canopy to extend between the peripheral zone of the canopy and the connecting arrangment, and an auxiliary suspension system extending between the connecting arrangement and the interior of the canopy, said auxiliary suspension system comprising upper and lower line arrangements each of which is disposed adjacent a line substantially on the axis of the canopy while the canopy is in streamer configuration and load transfer means radially disposed in said canopy and having opposed ends, one of said ends being secured to said upper and lower arrangements and the other end of said load transfer means being secured to the interior of said canopy, the arrangement of the two suspension systems being such that when in use the opposing forces of drag acting on the canopy and gravity acting on the load is substantially taken up by the auxiliary suspension system leaving the main suspension system essentially untensioned while the canopy is in streamer configuration and by the main suspension system when the canopy is fully deployed.

4,488,695

PIPE HANGER

Ray M. Rumble, Canfield, Ohio, assignor to Michigan Hanger Company, Inc., Hubbard, Ohio

Continuation-in-part of Ser. No. 257,599, Apr. 27, 1981, abandoned. This application May 24, 1982, Ser. No. 381,077

Int. Cl.³ E21F 17/02

U.S. Cl. 248—62 3 Claims

1. An improvement in a pipe hanger, which pipe hanger includes a strap to be positioned about a pipe to be suspended, the ends of said strap arranged to be moved to positions adjacent one another and secured to a threaded support rod, the improvement comprising means for securing said ends of said strap to said threaded support rod, said means consisting of end portions on said strap shaped to engage the opposite sides of said threaded support rod, and a ferrule movable coaxially of said support rod over said end portions of said strap so as to move said end portions against said threaded support rod in non-slipping engagement therewith, and means for locking said ferrule in said position against said end portions, said locking means consisting of at least one inward projection on said ferrule and a half circular groove in the exterior surface of at least one of said end portions of said strap disposed horizontally and transversely thereof and at least one vertical groove in said end portion of said strap extending between said horizontally disposed groove and the end of said strap adjacent said horizontally disposed groove and arranged to receive said inward projection of said ferrule when the ferrule is moved longitudinally of said end portions of said strap and rotated relative thereto.

4,488,696

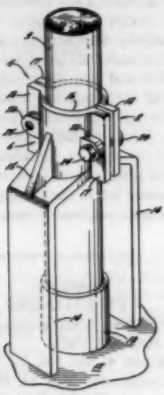
CABLE CLAMPING DEVICE

Charles J. Sauber, 10 N. Sauber Rd., Virgil, Ill. 60182

Continuation of Ser. No. 398,067, Jul. 14, 1982,. This application Apr. 13, 1984, Ser. No. 599,600

Int. Cl.³ F16L *3/08*

U.S. Cl. 248—74.1 **6 Claims**



1. In combination, a clamp and support assembly for hanging electrical cable in vertical position, and a horizontal building floor having an opening adapted to receive the cable passing through the opening, said assembly comprising a pair of integrally formed cast metal clamping devices each having an arcuate portion engaging the cable with flanges at opposite sides thereof, each flange having aperture means passing therethrough, a leg depending and extending outwardly from the arcuate portion angled first outwardly and then downwardly thereform to provide an assembly with a pair of legs parallel to each other and to the flanges, and bolt means for securing respective adjacent flanges of an opposed pair of said clamping devices together with the arcuate portions positioned about and clamping a cable therebetween and said legs resting on a member associated with the floor and supporting said arcuate portions of said clamping devices over said floor opening.

4,488,697

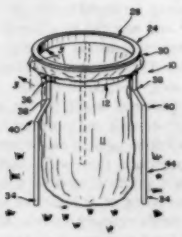
BAG HOLDER

Norman G. Garvey, 730 Randolph St., Harahan, La. 70123

Filed Nov. 16, 1982, Ser. No. 442,025

Int. Cl.³ B65B *67/04*

U.S. Cl. 248—101 **12 Claims**



1. In a bag holder for supporting an open-ended bag, the holder having an annular outer frame with a central opening sized to receive the open end of a bag passed upwardly therethrough and an upper lip surrounding the opening over which the end of the bag is folded, and an annular retaining ring sized to fit within the open end of the bag and the central opening of the frame and clamp the bag to the frame, the improvement comprising:

an outwardly extending, downwardly facing shoulder on said retaining ring adapted to overlie said lip; and

an annular resilient gasket surrounding said retaining ring beneath said shoulder adapted to bear against the bag resting on said lip to wedgingly and frictionally prevent downward movement of the bag between said frame and said retaining ring and facilitate easy separation of said retaining ring and said frame.

4,488,698

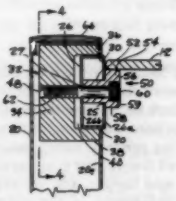
CONNECTION JOINT FOR ARTICLE OF FURNITURE

Fredrick B. Delafield, 6722 Amberley La., Clemmons, N.C. 27012

Filed Aug. 3, 1981, Ser. No. 289,321

Int. Cl.³ F16M *11/16*

U.S. Cl. 248—188 **4 Claims**



1. A connection joint for securing structural members of furniture items comprising:

(a) a tubular member having a cut out which is intermediate the ends of said tubular member;

(b) a second member having the same general configuration of at least a portion of said cut out, said second member having an aperture therethrough and fitting snuggly into said cut out;

(c) an insert clamp carried in said tubular member having a recess corresponding generally to the size of said cut out in said tubular member and a threaded aperture therein, said insert clamp being so positioned that the recess surrounds the cut out and the insert clamp engages the inside surface of said tubular member above and below said cut out;

(d) support element secured to said joint connection; and

(e) fastener means engaging said support element and second member and extending therethrough into said threaded aperture in said insert clamp holding said joint connection securely together.

4,488,699

DEVICE FOR REGULATING THE POSITION OF AN ELEMENT AND IN PARTICULAR A VEHICLE SEAT STRUCTURE

Claude Chevalier, Sully sur Loire, France, assignor to Compagnie Industrielle de Mecanismes, en abrege C.I.M., France

Filed Jan. 21, 1982, Ser. No. 341,341

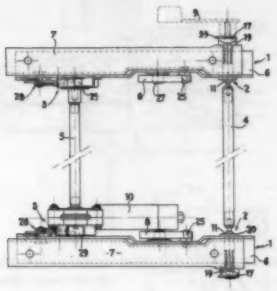
Claims priority, application France, Jan. 21, 1981, 81 01028

Int. Cl.³ A47C *1/025*

U.S. Cl. 248—396 **8 Claims**

1. A device for regulating the position of an element and in particular a vehicle seat, with respect to support therefor, said device comprising two movable structures which are transversely spaced apart from each other and are for fixing to said element, two fixed structures which are transversely spaced apart from each other and are for fixing to said support, and actuating means for selectively simultaneously locking the two movable structures relative to the two fixed structures in a

plurality of selected positions and simultaneously unlocking the two movable structures, said actuating means comprising, on each side of the device, a slide extending transversely of the device and having stepped portions having respectively larger diameter and a smaller diameter, the slide being slidable in a first of said structures on said each side, a second structure on said each side defining a slot including a plurality of circular apertures having a diameter equal to said larger diameter of said slide, at least one slot portion interconnecting said apertures and having a width which is a little greater than said



smaller diameter of said slide, said actuating means further comprising a shaft which extends transversely of said device and interconnects the two slides, and means for transversely displacing the two slides in synchronism, slidable connection means connecting the shaft to at least one of said slides and said displacing means comprising, for each slide, a rotary cam rigid with the slide and with means for driving in rotation, and a counter-cam fixed to said first structure, wherein said first structure has, on each side of the device and around the slide, a guide collar slidable in a press-formed recessed portion of said other structure.

4,488,700

MOTOR SUPPORT APPARATUS

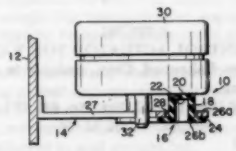
Toshiaki Nakamura, and Nobuhiro Miyabayashi, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1982, Ser. No. 384,419

Claims priority, application Japan, Jun. 9, 1981, 56-84499[U]

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—633 **12 Claims**



1. A motor support apparatus for supporting a motor, comprising:

a support member which includes a plate having a circular through hole therein, said plate having first and second opposed faces; and

at least one shock absorbing member for elastically supporting the motor, said at least one shock absorbing member including a cylindrical portion made of an elastic material and adapted to absorb motor vibration, said cylindrical portion having two ends, a support portion disposed at one end of said cylindrical portion, and a fixing portion radially extending outwardly from the other end of said cylindrical portion, said cylindrical portion having an outer diameter smaller than the diameter of said through hole of said plate, and said cylindrical portion being received into said through hole from its one end so that said one end extends above the first face of said plate and the outer peripheral surface of said cylindrical portion is spaced apart from the inner edge of said through hole, said fixing portion having a radially directed surface which is adhered to the second face of said plate, and said supporting portion adapted to be fixed to an outer surface of the motor above and spaced from said first face of said plate, whereby said shock absorbing member does not contact said first face or said inner edges of said through hole of said plate.

4,488,701

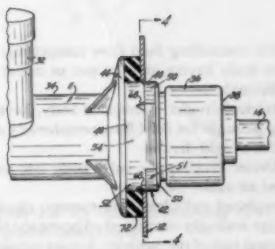
QUICK CONNECT CYLINDER MOUNT STRUCTURE

Keith V. Leigh-Monstevens, Troy, Mich., assignor to Automotive Products Plc., United Kingdom

Filed Jun. 10, 1982, Ser. No. 387,019

Int. Cl.³ F16M *7/00*

U.S. Cl. 248—637 **4 Claims**



1. A mounting structure for coupling a housing to a support plate comprisng a generally cylindrical peripheral surface portion on said housing, a substantially circular flange at one side of said generally cylindrical peripheral surface portion, at least a pair of symmetrically disposed radially projecting lugs at the other side of said generally cylindrical peripheral portion, a mounting opening in said plate of a perimeter generally conforming to the perimeter of said lugs and of said generally cylindrical peripheral surface portion such as to provide free passage of said lugs through said opening, a resilient gasket disposed around said generally cylindrical peripheral surface portion between said substantially circular flange and said lugs, said resilient gasket permitting passage of said lugs through said opening with resultant resilient compression of said resilient gasket, first abutment means on said generally cylindrical peripheral surface portion, said abutment means allowing rotation of said housing in a single direction after passage of said lugs through said opening for disposing each of said lugs in engagement with a rear surface area of said plate at an edge of said opening, second abutment means interfering with rotation of said housing in an opposite direction, and third abutment means limiting rotation of said housing in said single direction, wherein said first abutment means is a first tangential plane surface on said generally cylindrical peripheral surface portion, said second abutment means comprises a projection on said generally cylindrical peripheral surface portion at the junction between said surface portion and each of said lugs, said projection having a portion inclined away from said lug for causing further compression of said resilient gasket upon engagement with an edge of said opening during rotation of said housing and allowing relaxation of said resilient gasket after passage beyond said edge, and said third abutment means is a second tangential plane surface on said generally cylindrical peripheral surface portion, said second tangential plane

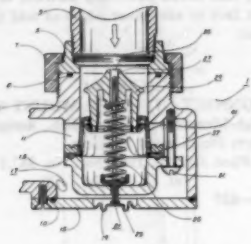
surface being disposed symmetrically to said first tangential plane surface.

4,488,702

ROLLING DIAPHRAGM METERING VALVE

James M. Lapeyre, P.O. Box 150699, New Orleans, La. 70150

Filed Sep. 29, 1983, Ser. No. 537,079
Int. Cl.³ F16K 31/12
U.S. Cl. 251—46 7 Claims



1. A valve controlling fluid flow comprising:
a. a valve body having an inlet and an outlet for fluid flow therethrough;
b. a cylindrical divider within said body, having an end and having passages for fluid flow peripherally disposed along the sides of said divider;
c. said divider dividing the valve body into an intake chamber and an outlet chamber;
d. a convoluted cylindrical elastomeric diaphragm having one edge sealingly connected adjacent to the preiphery of the closed end of the cylinder divider extending along the interior walls of the cylinder divider sealingly adjacent to the passages, being convoluted inwardly;
e. a diaphragm activating cup sealingly connected to the other end of the convoltued diaphragm forming thereby a metering chamber;
f. a flow metering orifice within said activating cup;
g. a dump means for dumping the fluid contents of the metering chamber to the exhaust chamber;
h. a biasing means biasing said actuating cup towards a maximum size of the metering chamber.

4,488,703

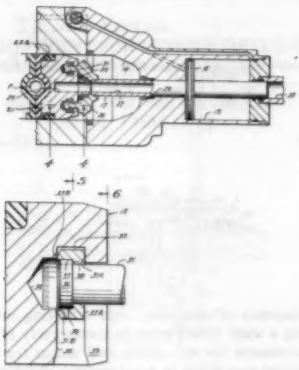
VALVE APPARATUS

Marvin R. Jones, 414 Flintdale, Houston, Tex. 77024, assignor to Marvin R. Jones, Houston, Tex.

Filed Feb. 18, 1983, Ser. No. 467,596
Int. Cl.³ F16K 3/314
U.S. Cl. 251—77 27 Claims

1. A blowout preventer, comprising a housing having a bore therethrough and chambers therein which intersect opposite sides of the bore, rams reciprocable within the chambers between outer positions to open the bore and inner positions sealably engaged with one another and the chambers to close the bore, and means for moving each of said rams between its opened and closed positions, including an axially reciprocable rod extending into the ram chamber, and means connecting the rod to the ram for limited axial movement with respect thereto, comprising a slot extending upwardly from the bottom of the ram, a pin on the inner end of the rod, and a bearing ring fitting closely about the inner end of the pin for relative axial movement with respect thereto, said ring having inner and outer sides adapted to fit closely within inner and outer sides of the slot to permit the ram to be lowered into or raised from connection with the rod when the rod is in its outer axial position with respect to said ram, and the inner side of the slot in said ram being recessed to receive the inner end of the pin when the rod is moved to its inner axial position with respect to said ram.

21. For use in a blowout preventer having a housing with a bore therethrough, chambers therein intersecting opposite sides of the bore, and means including an axially reciprocable rod extending into each chamber for moving a ram therein between positions opening and closing the bore; a ram comprising a ram body adapted for axial reciprocation within a chamber toward and away from the ram body of another ram reciprocable within the other chamber, means on the ram body



to form a continuous seal with respect to the other ram body and with respect to the chamber as the rams move into engagement with one another to close the bore, and means by which the ram body may be releasably connected to the axially reciprocating rod for limited axial movement with respect thereto and for support against sagging regardless of the axial position of the ram body with respect to the rod, including a slot extending upwardly from the bottom of the ram body, and a recess formed in said ram body on the inner side of and generally opposite the upper end of the slot.

4,488,704

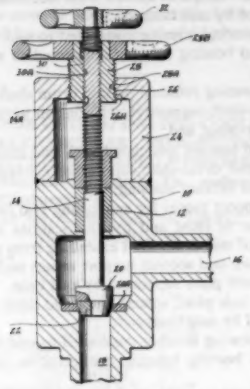
DUAL CONTROL ACTUATOR FOR VALVES

Gordon R. Wicker, Lakewood, Colo., assignor to AMAX Inc., Greenwich, Conn.

Filed Dec. 1, 1982, Ser. No. 445,891
Int. Cl.³ F16K 31/44
U.S. Cl. 251—265 8 Claims

1. In a valve having a body and a valve stem passing through the wall of said body and arranged to be moved in and out, the improvement comprising: a valve stem actuator mounting member attached to said body and surrounding said valve stem, and further having internal threads of a first predetermined number of threads per inch; an actuator nut having external threads corresponding to said first predetermined value and arranged to interengage with said first named threads, said actuator nut having a passageway therethrough arranged to surround said stem and having threads therein of a second predetermined value; the exterior surface of said valve stem having thereon threads mating with those of said second predetermined value of the actuator nut whereby said stem may be caused to move in and out of said valve body both by

rotating said actuator nut relative to said actuator mounting member and by rotating said valve stem relative to the internal



threads of said nut to obtain both fine and gross control of the position of said valve stem.

4,488,705

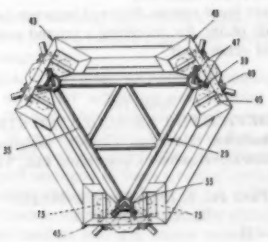
JACKING APPARATUS

John R. Sutton, P.O. Box 32, Beaumont, Tex. 77704

Filed Sep. 28, 1981, Ser. No. 306,366

Int. Cl.³ B66F *1/00*

U.S. Cl. 254—108 **19 Claims**



1. Jacking apparatus for effecting relative vertical movement between an upright leg having at least one vertical chord and defining an upright vertical column and a platform, comprising:

frame means for mounting on the platform, said frame means including at least two generally parallel vertical side rails;

first carrier means movably carried by said frame means for vertical movement relative to said rails; said carrier means being adjacent to said upright leg;

a first fluid cylinder means operably connected between said platform and said carrier means for effecting movement of said carrier means relative to said rails;

first and second elongated jack tracks fixedly secured in a generally vertical orientation to at least said one chord, each of said jack tracks being received within a correspondingly shaped recess in said carrier means, the orientation of the tracks and the recesses permitting only vertical movement of the carrier means relative to the tracks;

each of said jack tracks includes a plurality of regularly spaced openings extending completely through said jack track in a direction generally parallel to a circumference of said chord;

first and second holding means defining a pair of holding means supported by said carrier means for selectively engaging an aligned one of said openings in the first and second jack tracks respectively to prevent vertical movement of said carrier means relative to said chord; and

said pair holding means has a width which exceeds a width of the openings in said jack tracks in a direction parallel to the circumference of said chord.

4,488,706

MANHOLE COVER LIFTING HOOK

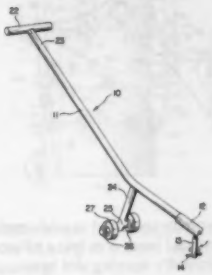
Kazuhiko Kono, No. 40, Kotakecho, 2-chome, Nerima-ku, Tokyo 176, Japan

Continuation of Ser. No. 477,274, Mar. 21, 1983, abandoned. This application Jun. 13, 1984, Ser. No. 619,696

Claims priority, application Japan, Apr. 1, 1982, 57-52305

Int. Cl.³ B66F *3/00*

U.S. Cl. 254—131 **2 Claims**



1. A lifting device for lifting a manhole cover having a hook-receiving hole, comprising:

an elongated lever rod having a load part at one end thereof and a handle on an opposite end thereof, said lever rod comprising an elongated bar having a shallow bend intermediate the ends thereof so that the bar has a shallow upwardly opening V-shaped configuration;

a support member fixed to said bar in the vicinity of said bend and projecting downwardly therefrom, and a roller supported on said support member adjacent the lower end thereof;

said load part of said rod having therein a substantially spherical cavity, said load part also having therein a narrow slot extending longitudinally of said lever rod and in communication with said cavity, said slot opening downwardly through the underside of said rod; and

a hook swivelly and pivotally mounted on said load part and depending downwardly therefrom for engagement with the hook hole in the manhole cover;

said hook including an elongated rodlike portion which projects downwardly through said slot and has a sidewardly projecting hook part fixed on the lower end thereof, said rodlike portion also having a ball-shaped portion fixed to the upper end thereof and rotatably retained in said spherical cavity for permitting the hook to both rotate about the longitudinal axis of the rodlike portion and vertically pivot along the longitudinal direction of the lever rod.

4,488,707

CHAIN BINDER AND REVERSING LEVER KNUCKLE

Earnest D. Mosley, P.O. Box 4922, and Oliver L. Williams, 321 John Chick Dr., both of Greenville, Miss. 38701

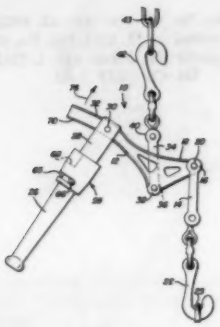
Filed Feb. 14, 1983, Ser. No. 466,013

Int. Cl.³ B25G *1/06*; F16C *11/00*

U.S. Cl. 254—243 **7 Claims**

1. An overcenter tensioning apparatus including an elongated crank member having first and second ends, a first elon-

gated tension member, first pivot means pivotally anchoring one end of said first tension member to said first end, a second elongated tension member, second pivot means pivotally anchoring one end of said second tension member to said crank member intermediate said first pivot means and the other end of said crank member, said crank member, when the other ends of said tension members extend outward in opposite directions, being swingable in one direction toward a limit position slightly past a center position from a release position to a tensioning position defined by said limit position, a lever arm



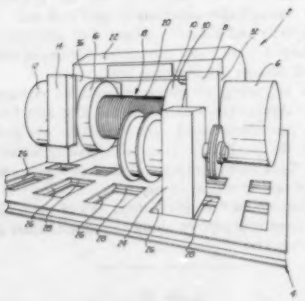
having one end pivotally anchored to said crank member other end, said one end of said lever arm being bifurcated and defining an endwise outwardly opening slot between the furcations thereof, said crank member other end being pivotally anchored between said furcations for oscillation relative thereto about an axis spaced from the terminal end of said other end of said crank member, said lever arm including abutment means supported therefrom from reverse positioning across opposite ends of said slot to prevent movement of said terminal end from the end of said slot blocked by said abutment means.

4,488,708

DRAW WORKS

James A. Frye, 1720 Drakestone, Oklahoma City, Okla. 73120

Filed Sep. 1, 1982, Ser. No. 413,709
Int. Cl.[3] B66D *1/14*
U.S. Cl. 254—355 4 Claims



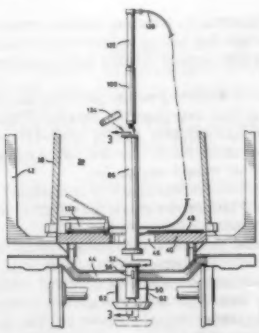
1. A draw works, comprising:
a base;
a drum shaft;
a drum associated with said drum shaft;
first support means for supporting said drum shaft off of said base at first and second spaced locations along a first section of said drum shaft extending from a first end of said drum, said first support means including:
a first side plate supported by said base;
a second side plate, spaced from said first side plate, supported by said base;
a first bearing housing connected to said first side plate;
a second bearing housing connected to said second side plate;
a first bearing retained on said drum shaft in rotative and drum-shaft-supportive relationship with said first bearing housing; and
a second bearing associated with said drum shaft in rotative and drum-shaft-supportive relationship with said second bearing housing;
second support means for supporting said drum shaft off of said base at third and fourth locations along a second section of said drum shaft extending from a second end of said drum, said second support means including:
a third side plate supported by said base;
a fourth side plate, spaced from said third side plate, supported by said base;
a third bearing housing connected to said third side plate;
a fourth bearing housing connected to said fourth side plate;
a third bearing retained on said drum shaft in rotative and drum-shaft-supportive relationship with said third bearing housing; and
a fourth bearing associated with said drum shaft in rotative and drum-shaft-supportive relationship with said fourth bearing housing;
said base including a plurality of support members extending transversely to said drum shaft and having said first, second, third and fourth side plates connected thereto;
first power input means, disposed between said first and second side plates, for receiving a first power input to rotate said drum shaft; and
second power input means, disposed between said third and fourth side plates, for receiving a second power input to rotate said drum shaft.

4,488,709

JACKING DEVICE FOR ARTICULATED STREETCAR

Dennis P. Chadwick, Napanee, Canada, assignor to Urban Transportation Development Corporation Ltd., Toronto, Canada

Filed Jul. 6, 1982, Ser. No. 395,112
Int. Cl.[3] B66F *7/26*
U.S. Cl. 254—423 16 Claims



1. A jacking device for a vehicle comprising a support member attached to said vehicle, a jacking member slidably supported by said support member and displaceable relative to said vehicle along a vertical axis, a reaction member detachably secured to said support member and extending therefrom

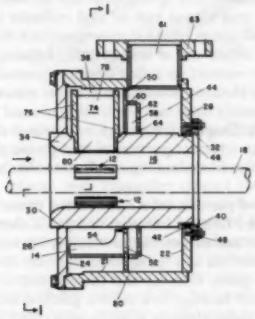
in a vertical direction on opposite sides of said axis, motor means located on said axis within said reaction member and acting between said jacking member and said reaction member to cause relative displacement therebetween, said motor means and said reaction member being demountable from said jacking member and said support means respectively for storage at a remote location.

4,488,710

APPARATUS FOR OPTIMIZING THE COOLING OF A GENERALLY CIRCULAR CROSS-SECTIONAL LONGITUDINAL SHAPED WORKPIECE

Joseph I. Greenberger, Pittsburgh, Pa., assignor to Wean United, Inc., Pittsburgh, Pa.

Filed Sep. 6, 1983, Ser. No. 529,822
Int. Cl.³ C21D *1/62*
U.S. Cl. 266—114 **8 Claims**



1. In a hot metal working line where a liquid coherent curtain of coolant is applied to cool a generally round, hot metal workpiece, comprising:

header means, comprising: an enclosed housing including dividing means for separating said housing into a first chamber through which said coolant flows and a second chamber in communication with said first chamber for receiving said coolant and further including means constructed and arranged to form a central opening through which said workpiece travels,

inlet means communicating with said first chamber for supplying said coolant into said header means,

means concentrically located relative to said central opening constructed and arranged in said first chamber for diffusing said coolant supplied by said inlet means, and having a chamber and passages for restricting the flow rate of said coolant at it travels into said chamber of said diffusing means,

a plurality of spaced-apart nozzle assemblies in said second chamber, radially arranged with respect to and concentrically spaced around said workpiece, each nozzle assembly having an elongated opening extending in a longitudinal direction along the length of said workpiece and constructed to deliver through said elongated opening said coolant in the form of a coherent curtain wall longitudinally along and radially onto an outer surface of said workpiece,

coolant restraining and directing means in said second chamber having passageways communicating with said diffusing means of said first chamber,

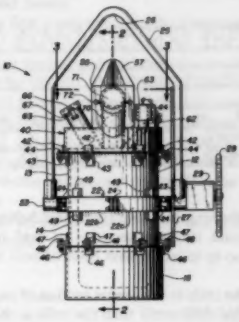
said coolant restraining and directing means arranged to alternate with at least two adjacent nozzle assemblies and constructed in a manner to receive and direct said coolant flow from said diffusing means of said first chamber into said immediately adjacent nozzle assemblies for said deliverance of said coherent curtain into said central opening of said header means onto said workpiece to effectively and uniformly cool said workpiece.

4,488,711

TREATING LADLE FOR DUCTILE IRON TREATMENT

Gerry E. Isenberg, Cassville; Terry L. Forshey, Calvin, and Robert D. Keller, Jr., Belleville, all of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Mar. 24, 1983, Ser. No. 478,393
Int. Cl.³ C21B *3/00*
U.S. Cl. 266—276 **14 Claims**



1. A treating ladle for use in a foundry in the production of ductile iron by the treating of molten base iron with a treatment alloy, comprising:

a body member including a generally vertical outer shell, said body member having an upper portion, a lower portion below said upper portion and an opening therethrough extending from said upper portion to said lower portion;

a bottom member including an outer shell having a generally horizontal floor portion and a generally vertically extending side portion integral with said floor portion;

fastening means for detachably connecting said bottom member to said lower portion of said body member, said fastening means including a first set of connecting tabs affixed to said lower portion of said body member in a spaced relationship around the perimeter of said body member, a second set of connecting tabs affixed to said side portion of said bottom member in spaced relationship around the perimeter of said bottom member, each connecting tab of said first set being alignable with a corresponding connecting tab of said second set, and a fastener for connecting each corresponding pair of connecting tabs to detachably connect said bottom member to said body member; and

a first refractory lining affixed to said body member shell and a second refractory lining affixed to said bottom member shell, said second refractory lining forming a pair of semicircular pockets with a refractory dam extending therebetween, the joint between said bottom member and said body member being sealed with a refractory paste.

4,488,712

LONGITUDINALLY LACED CONTINUOUS COIL SPRING ASSEMBLY

Larry Higgins, Carthage, Mo., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

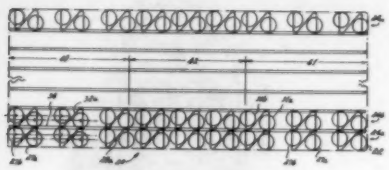
Filed Dec. 21, 1981, Ser. No. 332,490
Int. Cl.³ F16F *3/04*; A47C *23/04*
U.S. Cl. 267—91 **3 Claims**

1. A spring assembly having a long longitudinal dimension and a shorter transverse dimension, said assembly comprising, a plurality of parallel rows of coils, each of said rows extending longitudinally of the spring unit, each of said rows

being formed from a single continuous piece of wire and each of said rows containing a plurality of coils interconnected by interconnecting segments, alternate ones of said interconnecting segments being disposed in the planes of the upper and lower surfaces of said spring assembly, the axes of said coils in at least a large portion of said assembly being disposed generally perpendicular to the upper and lower surfaces of said spring assembly,

sections of each of said interconnecting segments of each row being overlapped relative to connecting segments of an adjacent row,

helical lacing means extending longitudinally parallel to said



rows for the length of said rows, said helical lacing means being wound through sections of said interconnecting segments so as to secure said rows of coils in an assembled relation,

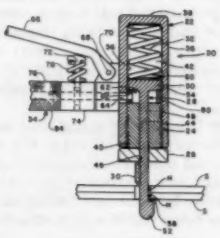
the axes of the coils in the center section of each of said rows being angled differently than the coils at the outer ends of each of said rows, the axes of adjacent coils at the outer ends of said row being angled oppositely so that the coils in the center section of each of said longitudinally extending rows of coils are more closely spaced than the majority of coils at the outer ends of each of said rows whereby greater firmness is imparted to the center section of said spring assembly than is imparted to the outer end sections.

4,488,713

PNEUMATIC CLAMPING DEVICE

Brian A. Kosmal, Tipp City, Ohio, and Frederick W. Auld, Fort Worth, Tex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 15, 1983, Ser. No. 475,664
Int. Cl.³ B23P *15/26*
U.S. Cl. 269—25 **1 Claim**



1. A pneumatic clamping device, comprising:

(a) a cylinder formed by a hollow housing having a closed end and an opposite open end;

(b) a guide element secured in said opposite end of said cylinder housing and spaced from said closed end thereof such that between said guide element and said closed cylinder end a pneumatic chamber is defined within said cylinder housing, said guide element having an elongated central bore;

(c) a bearing ring attached to said guide element and disposed outside of said cylinder housing, said ring having a central opening aligned with said central bore of said guide element;

(d) a piston having an elongated shaft, a cylindrical head on one end of said shaft and an offset foot on an opposite end of said shaft, said piston head disposed for rectilinear sliding movement within said chamber of said cylinder housing, said piston shaft extending through and movable along said central bore and opening of said guide element and bearing ring respectively upon movement of said piston head, and said offset piston foot disposed beyond said bearing ring outside of said cylinder and movable toward and away from said bearing ring upon corresponding movement of said piston head and shaft;

(e) a positioning pin attached to and extending from said bearing ring adjacent said central opening of said ring and outside of said cylinder, said pin also extending substantially parallel to said piston shaft extending from said ring opening;

(f) a compressible coil spring disposed between said piston head and said closed end of said cylinder housing, and biasing said piston head for movement in a direction away from said closed end of said cylinder housing and toward said guide element to a first position located adjacent to said guide element wherein said offset piston foot is disposed remotely from said positioning pin and bearing ring, allowing sufficient clearance for insertion of said piston foot and an adjacent portion of said piston shaft through aligned holes in a plurality of adjacent sheets of material; and

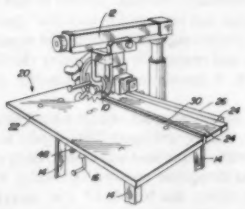
(g) a source of pressurized air connected to said chamber of said cylinder housing between said guide element and said piston head and actuatable for forcibly moving said piston head against said coil spring in an opposite direction away from said guide element and toward said closed end of said cylinder housing to a second position located remote from said guide element wherein said offset piston foot is disposed adjacent to said positioning pin and bearing ring such that in conjunction with said positioning pin substantially fill said aligned holes in said sheets of material, while in conjunction with said bearing ring forcibly clamp said sheets of material together.

4,488,714

MACHINE TOOL TABLE ADJUSTMENT MECHANISM

Fred Phillips, 25955 W. Sunset Rd., Barrington, Ill. 60010

Filed Mar. 23, 1983, Ser. No. 478,040
Int. Cl.³ B23Q *1/02*
U.S. Cl. 269—303 **24 Claims**



1. A locking device, for use on a machine tool table having a front table securely mounted on a plurality of table support rails and having a plurality of table portions interchangeably positioned on the support rails, comprising:

a rear board to place upon said support rails at the rear of said machine tool table;

a single pressure applying and releasing device mountable on the underside of said front table; and

means located on the underside of the machine tool table for connecting said pressure applying and releasing device to at least two points along said rear board so that when

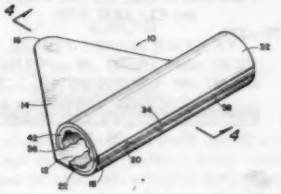
pressure is applied to said connecting means said rear board is pulled towards said front table to hold the portions of said machine tool table on said support rails securely in position.

4,488,715

APPARATUS FOR SUPPORTING THE ARM OF A PATIENT ON AN OPERATING TABLE

Perry J. Comeau, Rte. 3, Box 15, Valley Dr., Searcy, Ark. 72143

Filed Feb. 28, 1983, Ser. No. 431,684
Int. Cl.³ A61G *13/00*
U.S. Cl. 269—328 **7 Claims**



1. Apparatus for supporting the arm of a patient to an operating table, comprising:

a member of relatively thin rigid material having an integral generally planar and triangular shaped tongue portion having an inner and an outer end, the outer end being of a length equal to substantially the length of the portion of the arm of a patient to be supported and tapering inwardly to the inner end, the inner end being rounded, the length of the tongue portion from the inner to the outer end being at least one-half the width of the body of a patient, the tongue portion being thereby configured to slip between the body of a patient and the support surface of an operating table, the member having an integral arm receiving portion extending from the tongue portion outer end of a length to receive a substantial portion of the length of the arm of a patient, the arm receiving portion being upwardly and outwardly curved, the outer edge being above the plane of the tongue portion of a height of about the thickness of the arm of the patient;

means on the surface of said arm receiving portion to cushion the patient's arm supported thereon;

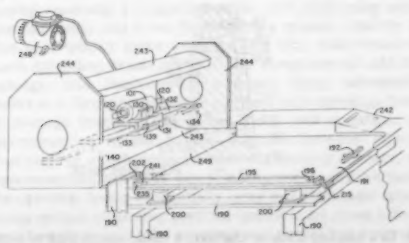
and means to retain the arm of the patient in engagement with said cushion surface of said arm receiving portion.

4,488,716

METHOD OF FEEDING MATERIAL TO AND RECEIVING IT FROM A SCANNING SYSTEM

Wah Sheck, Olney, Md., assignor to Crosfield Data Systems, Springfield, Va.

Filed Jun. 2, 1982, Ser. No. 383,927
Int. Cl.³ B65H *5/22*
U.S. Cl. 271—3 **10 Claims**



1. The method of feeding transports together with materials to be scanned to and from a scanning system, using a bed together with means for supporting a transport above the bed, said bed and means being at different levels with reference to each other, and said scanning system being adapted to receive and eject transports at only one level, comprising:

(a) placing a first transport on the bed,

(b) placing a second transport on said means,

(c) feeding the first transport into the scanning system,

(d) allowing the second transport to drop from said means onto said bed,

(e) repositioning the bed and said means so that when the first transport returns from said scanning system, it will pass onto said means,

(f) ejecting the first transport from the scanning system onto said means,

(g) repositioning the bed and said means to enable the second transport to be fed into said scanning system,

(h) feeding said second transport into said scanning system,

(i) allowing the first transport to drop from said means onto said bed,

(j) repositioning said bed and said means to permit said means to receive the second transport from the scanning system, and

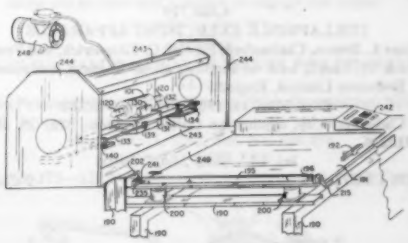
(k) ejecting the second transport from said scanning system onto said means.

4,488,717

APPARATUS FOR FEEDING MATERIAL TO AND RECEIVING MATERIAL FROM A SCANNING SYSTEM

Wah Sheck, Olney, Md., assignor to Crosfield Data Systems, Springfield, Va.

Filed Jun. 2, 1982, Ser. No. 383,929
Int. Cl.³ B65H *5/22*
U.S. Cl. 271—3 **16 Claims**



1. In a device for feeding a transport to, and receiving a transport from, a scanning system, said scanning system including means for receiving and ejecting a transport, comprising:

(a) a bed for supporting a first transport,

(b) support means, located above the bed, for supporting a second transport,

(c) control means for providing relative motion between (1) said bed and said support means on the one hand, and (2) said scanning system on the other hand,

(d) said control means including means for selectively placing said bed and said scanning system in a relative position to feed a transport on said bed into the scanning system and also for selectively placing said support means and said scanning system in a relative position so that said support means will receive a transport from the scanning system, and

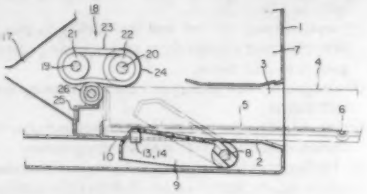
(e) means associated with said support means to effectuate lowering movement of a transport directly from said support means to said bed.

4,488,718

SHEET FEEDING MEANS

Takashi Tamura, Hachioji, Japan, assignor to Konishiriku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1982, Ser. No. 386,624
Claims priority, application Japan, Jun. 18, 1981, 56-93052
Int. Cl.³ B65H *1/14, 3/06*
U.S. Cl. 271—127 **2 Claims**



1. In a sheet feeding means having a mechanism to flap up a bottom plate of a sheet feeding cassette loaded on to a sheet feeding table by means of a flapping-up member which is incorporated into said sheet feeding table, the improvement comprising:

said flapping-up member being energized by a low tension biasing member in the direction of a flapping-up position,

a restraining member energized by a high tension biasing member in the direction of restraining said flapping-up member at a retracted position in said sheet feeding table, and

a sheet feeding drive for driving a sheet feeding operation in response to a sheet feeding signal,

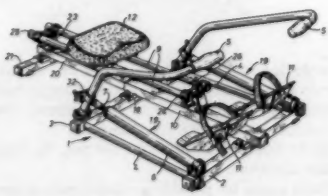
wherein said flapping-up member is restrained by said restraining member in said retracted position when no sheet feeding signal is given, and is released from said restraining member when the sheet feeding signal is given, whereby said flapping-up member is operated to flap up said bottom plate only during a sheet feeding operation.

4,488,719

COLLAPSIBLE EXERCISING APPARATUS

Peter L. Brown, Chelmsford; Patrick C. Fitzpatrick, and Frederick W. Lloyd, both of Harlow, all of England, assignors to Bodytone Limited, England

Filed Mar. 14, 1983, Ser. No. 475,188
Claims priority, application United Kingdom, May 25, 1982, 8215206
Int. Cl.³ A63B *21/00, 69/06*
U.S. Cl. 272—72 **9 Claims**



1. A rowing machine comprising:

a body having a frame which includes a longitudinal body member, ground engaging means for supporting the body, and foot bracing means for bracing the feet of a user;

at least one movable handle mounted on the body;

resistance means on the body providing resistance to movement of said handle;

an extension attached to the body and longitudinally adjustable relative thereto, said extension having a longitudinal extension member slidably engaged with said longitudinal body member, ground engaging means for supporting the extension, and longitudinal track means fixed to said extension above said longitudinal extension member;

sliding support means carried by the body for slidably supporting said track means;

lock means for adjustably fixing the longitudinal position of the extension relative to the body, and

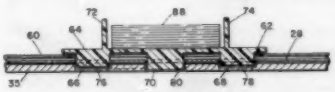
a seat slidable along said track means.

4,488,720

FOLDABLE GAME BOARD WITH ROTATABLE DISPLAY DISK

Eugene F. Cook, 5858 Mt. Alifan Dr., San Diego, Calif. 92111

Filed Dec. 9, 1982, Ser. No. 448,317
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—239 **6 Claims**



1. A game board comprising:

first and second game board sections,

said first and second sections being hingedly joined along mating edges,

each of said sections comprising a plurality of layers, said layers being comprised of at least one upper layer and one lower layer,

a display disk received between said layers for rotation with respect to said first and second sections,

said display disk comprising generally planar sheet material and having a medial fold line,

means for applying rotational force to said display disk to cause said display disk to move through a rotational arc, said rotational arc including at least one position in which said fold line of said disk is aligned with said mating edges of said first and second sections,

said display disk incorporating a series of game information displays spaced from a central axis,

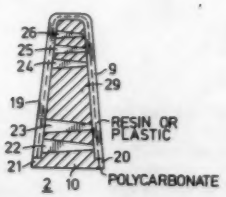
said upper layer of each of said first and second sections incorporating thereon at least one viewing window for alignment with said game information displays at a selected rotational position of said disk.

4,488,721

HOCKEY STICK BLADE WITH SYNTHETIC COATING AND EXPOSED WEAR RESISTANT BASE

Donald R. Franck, 15 Lennox Dr., Binghamton, N.Y. 13903, and Warren G. Grady, Jr., Hilltop Rd., Endwell, N.Y. 13760

Filed May 21, 1982, Ser. No. 380,533
Int. Cl.³ A63B *59/12*
U.S. Cl. 273—67 A **10 Claims**



4. In a hockey stick or the like, a blade comprised of a core structure of wear resistant material having two substantially vertical surfaces, one of which is the primary striking surface, and a base portion; said base portion of said core extending

horizontally beyond said substantially vertical surfaces; and, a first covering of a synthetic material secured to said base portion of said core and extending vertically upward from said base portion to cover said vertical surfaces and the entirety of the blade excepting the portion of said base of said core extending beyond said vertical surfaces to provide a blade of the proper size and weight and resistant to wear and impact.

4,488,722

SAFETY TENNIS RACQUET

Gunter Harz, 4415 Pine St., Omaha, Nebr. 68105

Filed Oct. 28, 1981, Ser. No. 315,895
Int. Cl.³ A63B *51/06*
U.S. Cl. 273—73 D **12 Claims**

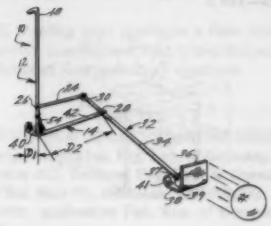
1. A tennis racquet comprising a frame having an outer end and an inner end, said frame having a string opening therethrough adjacent its outer end, strings comprising main string means comprising a plurality of single main string means defined as mains and cross string means comprising a plurality of single cross string means defined as crosses, a plurality of mains extending from the inner to the outer end of said opening and disposed alongside each other, a plurality of crosses disposed alongside each other and spaced with respect to each other and extending transversely of said mains, a plurality of ball grips, each ball grip having an opening therethrough receiving a respective one of said mains, means retaining each of said grips in a position along its main, a substantial number of said mains and crosses being free of interweaving whereby said strings yield more easily than the strings of a completely interwoven string racquet whereby the ball stays longer in contact with said strings for providing more control and whereby the jolt of the racquet striking the ball hard is lesser for reducing the corresponding jolt on the arm of the player, said strings being attached to said frame and extending across said opening, said outer end of said frame having two substantially planar oppositely facing sides, said mains in total and crosses in total each normally defining configurations having substantially planar outer surfaces parallel to said planar sides of said frame, said mains being in two groups, one of said groups of mains being on one side of said crosses and the other of said groups of mains being on the other side of said crosses, both of said groups of mains having said ball grips thereon whereby the benefit of said grips is available for striking a ball adjacent each of said groups of mains, said two groups of mains being out of contact with each other at all times, those of said grips which are disposed on one of said groups of mains being free of any connection to those of said grips which are disposed on the other of said groups of mains except such connection as is indirect through said strings, said ball grips being spaced ball gripping tubes disposed alongside each other, each tube having an elongated opening receiving a respective main, stiff connecting means interconnecting said tubes for defining a spinner whereby the tubes of a spinner move together as a unit, said connecting means extending transversely to the elongation of said tube openings, said interconnecting means being substantially smaller in a direction lengthwise of said tube openings than is the average length of said tubes along said openings, said interconnection means having portions between adjacent tubes each of which defines an interconnecting element, said interconnecting elements being in alignment, said elongated tube openings being substantially lying in a plane, said spinner having spaced projecting portions spaced apart along a line at a right angle to said tube openings and projecting outwardly from the plane of said tube openings farther than portions disposed between said tubes, said crosses being thicker than said mains and extending across the center area of said frame opening.

4,488,723

RECREATIONAL DEVICE FOR IMPELLING AN OBJECT

Alfred C. LaGrow, 3615 N. Harvard Ave., Peoria, Ill. 61614

Filed Sep. 23, 1982, Ser. No. 421,997
Int. Cl.³ A63B *71/00*
U.S. Cl. 273—129 T **11 Claims**



1. A recreational device (10) for impelling an object forwardly comprisng:

a generally upright shaft (12) having a lower end (20);

a lever arm (14) pivotally connected to the lower end (20) of the shaft (12) at a coupling joint (16) and having a lower rear heel portion (40) and an upper front actuating portion (42);

a stabilizing link (24) pivotally connected to the shaft (12) above the lever arm (14) and extending forwardly from the shaft; and

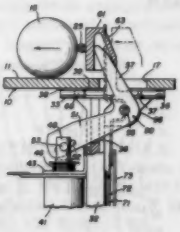
impelling means (32) for urging the object forwardly in the same direction that said stabilizing link extends from said shaft in response to downward movement of the shaft (12) rolling engagement of the heel portion (40) against a surface, and forward and downward swinging movement of the actuating portion (42) of the lever arm (14) about the coupling joint (16), the impelling means (32) being pivotally connected to the stabilizing link (24) and to the lever arm (14) and having a front impact element (36) slideable along the surface and adapted to engage the object.

4,488,724

HORIZONTALLY MOVABLE KICKER FOR PIN BALL GAME

Albin Peters, Chicago, Ill., assignor to Wico Corporation, Niles, Ill.

Filed Jan. 11, 1982, Ser. No. 338,314
Int. Cl.³ A63F *7/00*
U.S. Cl. 273—129 S **22 Claims**



1. A pin ball kicker apparatus comprising a frame, a drive solenoid carried by said frame and having a reciprocating plunger, a kicker member carried by said frame for only rectilinear reciprocating movement with respect thereto along a rectilinear path disposed generally perpendicular to the axis of said solenoid plunger, and drive linkage means carried by said frame and interconnecting said drive solenoid plunger and said kicker member and responsive to actuation of said drive solenoid for effecting movement of said kicker member along said path.

4,488,725

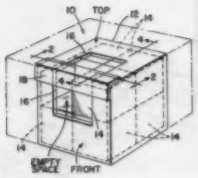
FLIP CUBE PUZZLE

William H. Clark, 7731 W. Lake Dr., Lake Clarke Shores, Fla. 33406

Continuation-in-part of Ser. No. 384,550, Jun. 3, 1982, abandoned. This application Aug. 9, 1983, Ser. No. 521,588

Int. Cl.³ A63F *9/08*

U.S. Cl. 273—153 S **12 Claims**



1. A flip cube puzzle manipulatable by a player, said cube puzzle comprising: a box structure of parallelepipedon form including a top side, a front side, two lateral sides, and having a hollow rectangular interior housing in slidable relationship a predetermined number of uniformly sized cubes in at least one tier, the number of cubes being at least one less than the housing capacity of said rectangular interior, the vertical and horizontal dimensions of said rectangular interior being sufficient to permit rotation of one of the cubes in the vertical and horizontal tiers immediately adjacent to the top, front, and one lateral side of said box structure from one face to an adjacent face thereon, the top and front side of said box structure each having an aperture in register with each other and being wider than one of said cubes and laterally positioned to expose a portion of the cube to be rotated and a portion of an adjacent vacant space thereto for entry of a finger tip of said player through either of said apertures for purpose of plucking and flipping the cube to be rotated from one face to an adjacent face thereon with the flipped cube remaining in its original position in the rectangular interior of said box structure.

4,488,726

SPORTS TRAINING GLOVE INCLUDING PRESSURE ACTUATED SWITCHES FOR ALARM CIRCUIT

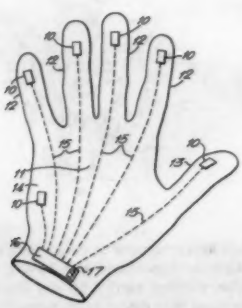
William F. Murray, Carrig House, Roundwood, County Wicklow, Ireland

Filed May 3, 1983, Ser. No. 491,174

Claims priority, application Ireland, May 7, 1982, 1105/82

Int. Cl.³ A63B *69/36*

U.S. Cl. 273—183 B **8 Claims**



1. A sports practice glove for use with a club, racket, bat or other item of sports equipment having a handle to be gripped, the glove comprising:

a plurality of independently operable pressure-operated switches operable in response to a predetermined switching threshold pressure being arranged on an inside gripping surface of said glove; and

an alarm circuit coupled to the switches in such manner that the alarm is actuated when the pressure on any one or more of the switches is reduced below the switching threshold pressure of the switch, the switches being disposed at locations on the glove which will bear against the handle of the sports equipment when the latter is properly gripped.

4,488,727

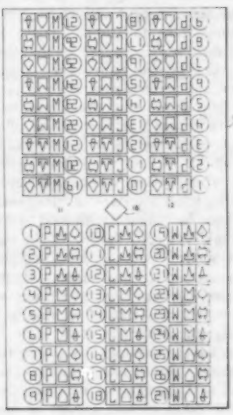
BOARD GAME HAVING ROCK, SCISSORS, PAPER TYPE THEME

Roger K. Lam, 11889 Dogwood Ave., Fountain Valley, Calif. 92708

Filed Jan. 7, 1983, Ser. No. 439,179

Int. Cl.³ A63F *3/00*

U.S. Cl. 273—236 **8 Claims**



1. In a game, the combination comprising:

a game board accommodating two players providing first and second identical patterns having twenty-seven numbers, each number accompanied by symbols arranged in different configurations, with each configuration containing three coded symbols, and each symbol representing one member of three different related groups of attributes, said first and second patterns respectively being arranged on opposite sides of a neutral field; and

a plurality of playing units, there being a sufficient number of playing units so that each player is provided with equal and identical sets of playing units, each of said playing units being comprised of three playing pieces, in which all three different related groups of attributes are symbolized in each playing unit, one side of the said playing piece being coded with a number and the other side being coded with the symbol of one of said members, the members of any one group having the same attribute, said attributes comprising a circular pattern consisting of first, second and third attributes, said attributes having magnitudes such that when any two of the three attributes are paired in a challenge, one attribute is always superior to another, such that said first is superior to said second, said second is superior to said third, and said third is superior to said first, so that when any two attributes of the circular pattern are matched, there is always a predetermined winner.

4,488,728

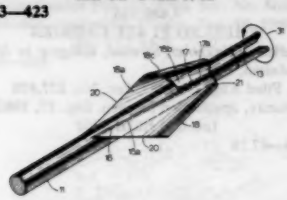
ARCHERY ARROW HAVING A COLLAPSIBLE TAIL ASSEMBLY

Stanley A. Humphrey, 3212 3rd Ave. South, Minneapolis, Minn. 55408

Continuation-in-part of Ser. No. 373,429, Apr. 30, 1982, abandoned. This application Jun. 23, 1983, Ser. No. 507,055

Int. Cl.³ F41B *5/02*

U.S. Cl. 273—423 **9 Claims**



1. An arrow that includes an axially elongated arrow shaft having a central axis, a peripheral surface, a front end and a rear end, and a plurality of vanes mounted on the shaft adjacent the shaft rear end, each vane being of a semi-rigid material and having an axially elongated first edge portion secured to the shaft, an axially elongated first leg having an axially elongated first edge joined to the first edge portion along a juncture line adjacent the shaft peripheral surface and an axially elongated second edge remote from the peripheral surface, the above mentioned juncture line having a front end and a rear end that is angularly offset relative the shaft central axis from the front end, an axially elongated transversely arcuately curved portion that is curved to open generally toward the shaft peripheral surface, the arcuately curved position having a first axially elongated edge joined to the first leg second edge, and an axially elongated second leg that has a first edge joined to the arcuately curved portion second edge and a second edge and an axially elongated second edge portion that is joined along a second line of juncture to the second leg second edge adjacent the shaft peripheral surface, the second portion being secured to at least one of the shaft and the first end portion, the second line of juncture having a front end and a rear end, the second line of juncture rear end being substantially more closely adjacent the shaft rear end than the first line of juncture front end.

4,488,729

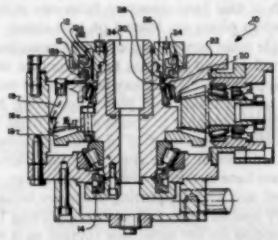
DRILL BOX

Thomas A. Story, State College, and Edward P. Peglow, Eighty Four, both of Pa., assignors to Step Design, Eighty Four, Pa.

Filed Sep. 8, 1983, Ser. No. 530,376

Int. Cl.³ F16J *15/34*

U.S. Cl. 277—15 **9 Claims**



1. A sealing system for a vertical shaft gear box, comprising:

a vertical mechanical seal, the rotating member of said seal secured to a vertical shaft through a seal retainer and the stationary member secured to the top cover of the gear box;

a tube disposed within the housing of said gear box and positioned outside the arc proscribed by the rotating reduction gear of said gear box;

a main reservoir of fluid in contact with said reduction gear, one end of said tube submerged therein;

a secondary reservoir positioned beneath said seal, the second end of said tube in communication therewith; and

a vane disposed within said secondary reservoir and attached to said seal retainer;

wherein said seal retainer rotates with said seal rotating member, causing said vane to splash said fluid onto said seal; and

wherein said rotating gear produces a fluid vortex in said main reservoir, causing said fluid to rise into said tube and be transferred to said secondary reservoir.

4,488,730

DEVICE FOR SEALING A RING GEAR

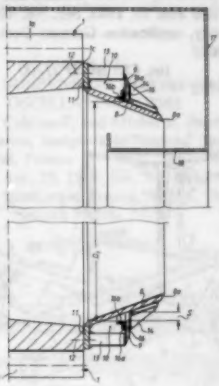
Heinz Grachtrup, Ennigerloh, Fed. Rep. of Germany, assignor to Krupp Polysius AG, Beckum, Fed. Rep. of Germany

Filed May 31, 1983, Ser. No. 499,272

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1982, 3223444

Int. Cl.³ F16H *57/04*

U.S. Cl. 277—18 **16 Claims**



1. A sealing device for a rotary ring-like member mounted for rotation about a substantially horizontal axis by means of a rotary drive which dips into an oil bath, said device comprising a conical annulus having its large diameter end fixed to said member radially inwardly of its periphery; a ring encircling said annulus; and locating means engaging said ring and positioning the latter on said annulus at a zone axially spaced from said member, thereby forming an annular oil collecting chamber between said member and said ring.

4,488,731

MULTIPLE-JAW CHUCK

Moshe Zaloof, 14 Hamelacha St., Or Yehuda, Israel

Filed Sep. 8, 1982, Ser. No. 415,925

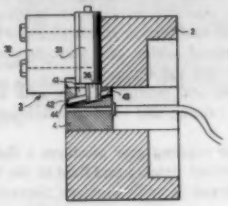
Claims priority, application Israel, Jun. 8, 1982, 66006

Int. Cl.³ B23B *31/16*

U.S. Cl. 279—121 **15 Claims**

1. A multiple-jaw chuck for clamping workpieces, comprising a housing having a longitudinal axis and a drive cylinder driven parallel to said longitudinal axis and driving a plurality of chuck jaws towards and away from said longitudinal axis, characterized in that said drive cylinder includes an axially-extending pin for each of said chuck jaws which pins are fixed to the drive cylinder at an acute angle to the longitudinal axis of the housing, each of said chuck jaws including a bore formed at the same acute angle to the longitudinal axis of the housing and receiving said pin, such that each of said chuck

jaws is driven radially towards and away from said longitudi-



nal axis of the housing when the drive cylinder is driven parallel to the longitudinal axis of the housing.

4,488,732

CHASSIS FOR SELF-PROPELLED AGRICULTURAL MACHINE

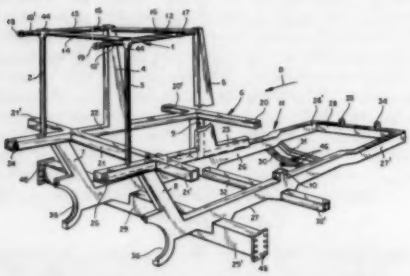
Heinz Lehmann; Heinz Rossnik, and Reinhard Blumenthal, all of Schönebeck, German Democratic Rep., assignors to Veb Kombinat Fortschritt Landmaschinen Neustadt in Sachsen, Neustadt in Sachsen, German Democratic Rep.

Filed Jan. 19, 1983, Ser. No. 459,196

Claims priority, application German Democratic Rep., Jan. 20, 1982, 2368626

Int. Cl.³ B62D *21/00*

U.S. Cl. 280—781 **7 Claims**



1. A chassis for a self-propelled agricultural machine adapted to travel in a predetermined longitudinal horizontal direction, the chassis comprising:

a lower frame having

a pair of longitudinally extending rigid lower side beams having outwardly offset rear ends, and

a plurality of longitudinally spaced and transversely extending lower cross beams fixed to and bridging the lower side beams;

a middle frame above the lower frame and having

respective transversely spaced front posts fixed to the lower side beams,

respective transversely spaced rear posts fixed to the lower side beams behind the front posts,

respective middle longitudinal side beams fixed to the upper ends of the respective posts above the lower side beams and having front ends projecting forward of the front posts relative to the travel direction, and

respective front and rear middle cross beams fixed to the middle side beams and projecting transversely beyond the side beams; and

an upper frame above the middle frame and having

respective transversely spaced upper front posts extending up from the middle side beams,

respective transversely spaced upper rear posts fixed to and extending up from the middle side beams behind the upper front posts,

respective upper transversely spaced upper side beams fixed to the upper ends of the upper posts and projecting forwardly beyond the front upper posts, and

respective upper longitudinally spaced front and rear cross beams extending between the upper side beams.

4,488,733

WHEELED PLATE CARRIER

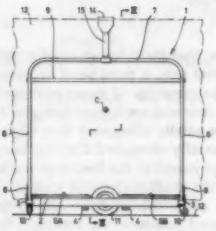
Tord M. Hellsten, Vaxholm, Sweden, assignor to Aktiebolaget Gyproc, Malmo, Sweden

Filed Aug. 29, 1983, Ser. No. 527,476

Claims priority, application Sweden, Sep. 17, 1982, 8205340

Int. Cl.³ B62B *3/04*

U.S. Cl. 280—47.16 **12 Claims**



1. A hand-operated, wheeled plate carrier for transporting a small number of large-sized, generally rectangular plates at a time and comprising

(a) a stand having an elongate base structure;

(b) bracket means provided on said base structure along one longitudinal side thereof only to form a support, on which the plates to be transported may be rested on edge in a nearly upright position;

(c) an upper frame structure secured to and extending upwardly from said base structure inside said bracket means thereon in a manner to form a lateral support, against which the plates to be transported may be leaned, said upper frame structure extending mainly in the longitudinal direction of said base structure;

(d) means connected to said upper frame structure for releasably retaining the plates to be transported in their nearly upright position, in which they are seated on said bracket means and leaned against said upper frame structure;

(e) a handle element forming part of said upper frame structure and arranged in a manner to be conveniently grasped by an operator along at least a considerable part of the length of said base structure from one side of said stand also when plates are loaded on said stand;

(f) a single main supporting wheel of considerable diameter mounted on said elongate base structure in a position at least approximately midway between the ends thereof and close to and inside said plate supporting bracket means thereon in a manner to rotate about a fixed axis extending in the transverse direction of said base structure; and

(g) two additional supporting members mounted on said elongate base structure near the respective, opposite ends thereof, said two supporting members being substantially equally spaced from said plate supporting bracket means and located on the same side thereof as is said main supporting wheel but further away from said bracket means than said wheel,

whereby said stand, whether loaded or not, on a substantially horizontal surface may be placed in a stable position of rest, in which it is supported by said main supporting wheel as well as by said two additional supporting members, and from which an operator grasping said handle element may swing it up into an erect transporting position in which it is supported by said single main supporting wheel only.

4,488,734

SKI BRAKE

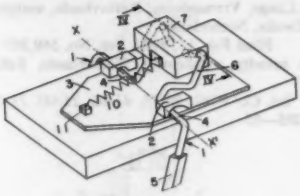
Jean J. A. Beyl; Jean Bernard, both of Nevers; Christian Campillo, Garchizy; René Guerreau, Montmarault; Daniel le Faou, Varennes Vauzelles, and Henri Peyre, Nevers, all of France, assignors to Ste Look, Paris, France

Continuation of Ser. No. 267,248, May 26, 1981, abandoned. This application Feb. 22, 1984, Ser. No. 581,212

Claims priority, application France, Jun. 10, 1980, 80 12836

Int. Cl.³ A63C 7/10

U.S. Cl. 280—605 **5 Claims**



1. In a ski boot operated ski brake comprising a pair of pivoting brake arms disposed symmetrically on one and the other side of the ski, said brake arms each having an individual braking end portion movable toward a lower nonretracted braking position and a raised retracted nonbraking portion, an opposite control end portion supporting a control pedal between them, and an integral bent portion intermediate said end portions and pivotally mounted on the ski with angular play in the ski plane in the transverse direction, and spring means urging said arms into their nonretracted braking position, the improvement in which said control pedal is formed as a box-like member having a top flat surface for receiving the bottom of said ski boot and in which said spring means is formed as a unit distinct from said control pedal but connected at one end to said ski at the other end to the underside of said pedal, and comprising means forming an elbowed extension at the end of each control end portion of each brake arm, and means forming bearings within opposite sides of said control pedal respectively supporting said elbowed extensions and forming the sole means for guiding said control pedal relatively to said ski, said pedal in its nonretracted braking position extending in a plane at an angle to the plane of said braking end portions with the axes of the respective bearing means and the end elbow extensions forming a V lying in a plane perpendicular to said top flat surface of the control pedal and having a downwardly directed point, whereby upon depression of said pedal under action of the ski boot against the extendible action of said spring means, the intermediate bent portion of each brake arm in the pedal-depressed position of the brake shifts in its pivoted mounting on the ski to move the brake end portions into a retracted position with respect to the ski edges.

4,488,735

COLLAPSIBLE LIGHTWEIGHT TRAILER

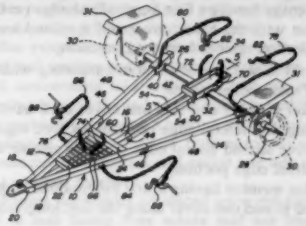
Herbert Hehr, 109 2nd Ave. SE., Kulm, N. Dak. 58456

Filed Feb. 2, 1983, Ser. No. 463,275

Int. Cl.³ B62D 63/06

U.S. Cl. 280—656 **9 Claims**

1. A collapsible lightweight trailer including front and rear frame sections, said front section including opposite side rearwardly divergent front frame members including forward ends anchored relative to each other and laterally spaced apart rear ends, said rear section including opposite side rearwardly divergent rear frame members including laterally spaced apart forward ends and rear ends supported from opposite end portions of a transverse axle assembly having ground engageable support wheels journalled from its opposite ends outwardly of the rear ends of said opposite side rear frame members, a trailer hitch assembly carried by the forward portion of said front frame section for removable coupling to a towing vehicle, the front and rear ends of said rear and front frame members being removably telescopingly engaged with each other, means releasably locking said telescopingly engaged frame member ends against disengagement from each other, the rear ends of said rear frame members being readily disengageably supported from the opposite end portions of said axle assembly,



the opposite end portions of said axle assembly including forwardly convergent horizontal mounting sleeve members supported therefrom and open at their front and rear ends, the rear end portions of said rear opposite side frame members being removably telescopingly anchored within said sleeve members.

4,488,736

VEHICLE SUSPENSION INCORPORATING OSCILLATING ARMS

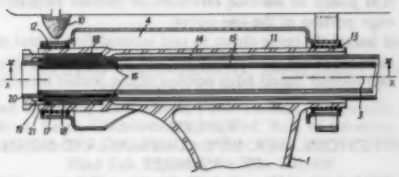
Jacques A. Aubry, Cabries-F, and Michel R. Bonfils, Saint-Canat, both of France, assignors to Societe' Nationale Industrielle Aerospatial, France

Filed Apr. 20, 1983, Ser. No. 486,794

Claims priority, application France, May 6, 1982, 82 07909

Int. Cl.³ B60G 11/18

U.S. Cl. 280—723 **5 Claims**



1. In a suspension for two wheels of a vehicle,

a pair of arms mounted on said vehicle for rotation about a transverse axis relative to said vehicle, each arm carrying one of said wheels,

pivot means attached to said vehicle for permitting said transverse axis to oscillate along the longitudinal axis of said vehicle,

an assembly comprising inner and outer concentric tubes formed of composite fiber-synthetic resin material, said tubes being coaxial with said transverse axis, said tubes being effectively connected at each of their ends to each other and to one of said arms,

the outer tube of said assembly being connected to said vehicle at at least one point intermediate its ends by means allowing longitudinal oscillation of said assembly.

4,488,737

COMBINED KEY HOLDER AND BOOKLET

Anthony S. Jacobs, Glencoe; James E. Riley, Deerfield, and Jon D. Christman, Northbrook, all of Ill., assignors to The Wessel Company, Inc., Elk Grove Village, Ill.

Continuation-in-part of Ser. No. 294,453, Aug. 20, 1981,. This application Jul. 14, 1982, Ser. No. 398,099

Int. Cl.³ B42D 3/00

U.S. Cl. 281—31 **10 Claims**

1. An article of manufacture comprising:

a pair of covers joined together along a junction;

pocket means comprising a pocket member, attached to one of said covers, for holding a key;

said pair of covers and said pocket member having lateral and longitudinal dimensions;

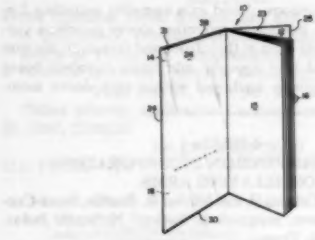
the lateral dimension of each cover and of said pocket member being constant along the entire length thereof;

said one cover having a first longitudinal edge portion at the junction with the other cover and a second longitudinal edge portion remote from said junction;

a lateral slit in said one cover communicating with the interior of said pocket means;

said pocket member and said one cover each having corresponding first lateral edge portions secured together and respective second lateral edge portions remote from said first lateral edge portions;

said pocket member having a first longitudinal edge portion adhered to said one cover along the first longitudinal edge



portion of the one cover, between the pocket member's first and second lateral edge portions, at least as far as said lateral slit;

said pocket member having a second longitudinal edge portion joined to the one cover at the second longitudinal edge portion of the one cover;

said lateral slit being closer to said secured first lateral edge portions of the pocket member and the one cover than to said second lateral edge portion of the pocket member.

4,488,738

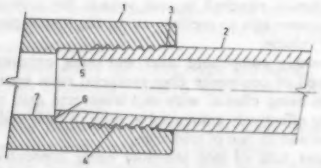
SYNTHETIC PLASTIC PIPE COUPLING AND METHOD OF ASSEMBLY

Osvaldo J. Valdes, Alameda 4463, Santiago, Chile

Filed May 12, 1981, Ser. No. 262,986

Int. Cl.³ F16L *35/00*

U.S. Cl. 285—40 **14 Claims**



1. A synthetic plastic pipe coupling consisting of an internally threaded fitting of synthetic plastic material and a pipe of synthetic plastic material having threaded and unthreaded portions within said fitting, said material of said fitting being harder than said material of said pipe so that said threads of said fitting create threads on the portions of said pipe within said fitting as the pipe is screwed into said fitting, said fitting defining an enlarged opening for directing said pipe into said fitting, an internally threaded portion adjacent said enlarged opening having grooves of said threads equal in diameter to the diameter of the enlarged opening, an internal unthreaded portion adjacent said threaded portion and an annular shoulder, said unthreaded portion terminating at said shoulder which defines a smaller inner bore of said fitting, said pipe defining an external unthreaded portion adjacent an end corresponding to said unthreaded portion of said fitting, said unthreaded portion of said pipe having had threads erased therefrom by said unthreaded portion of said fitting and an external threaded portion corresponding to said threaded portion of said fitting, said end of said pipe abutting said shoulder of said fitting.

4,488,739

INSULATING PIPE PART

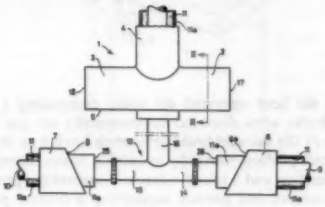
Tinus de Lange, Vroomshoop, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands

Filed Feb. 12, 1982, Ser. No. 348,207

Claims priority, application Netherlands, Feb. 17, 1981, 8100776

Int. Cl.³ F16L *59/16, 41/00, 25/00, 21/00*

U.S. Cl. 285—55 **1 Claim**



1. An insulated branch pipe joint comprising a central branch pipe part having two lateral branch pipe part stubs disposed opposite each other and a complemental third branch pipe part section being connected therewith and providing an insulating casing, said insulating casing being composed of an insulating pipe part having a continuous wall part having a slit provided in the bottom wall portion opposite said central branch pipe part, said third insulating branch pipe part section having a central closed wall and being integral with the walls of the two opposed insulating pipe part sections, each of the two opposed insulating pipe part sections being provided with sleeves of thermoplastic material preferably polyolefins heat shrunk clampingly engaging the two branch pipe part stubs, each said sleeve being provided with a beveled front end in a manner so that each overlaps the opposite sleeve in the wall portion of the insulating pipe part having the slit thereby closing the slit moisture tight.

4,488,740

BREECH BLOCK HANGER SUPPORT

Benton F. Baugh; Herman O. Henderson, Jr., both of Houston; John H. Fowler, Spring, all of Tex., and Arthur Ahlstone, Ventura, Calif., assignors to Smith International, Inc., Newport Beach, Calif.

Filed Feb. 19, 1982, Ser. No. 350,374

Int. Cl.³ F16L *15/00*

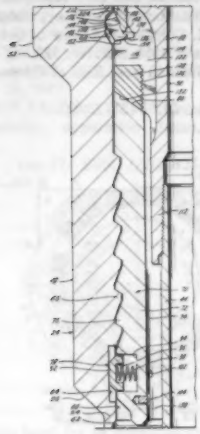
U.S. Cl. 285—84 **51 Claims**

1. A hanger-support member for supporting at least one pipe hanger within a wellhead of a well, the pipe hanger having a first string of pipe attached thereto, and for suspending a second string of pipe within the well, the wellhead having a plurality of circumferentially spaced-apart groupings of tooth segments projecting into the wellhead bore for engagement with the hanger-support member, comprising:

a tubular body received within the wellhead;

a plurality of circumferentially spaced-apart groupings of tooth segments disposed on the periphery of said tubular body and adapted for releasably engaging the tooth segments of the wellhead;

shoulder means on said tubular body adapted for engagingly supporting the pipe hanger; and



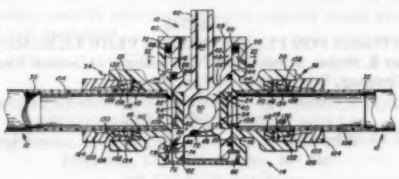
attachment means on said tubular body for attaching the second string of pipe to said tubular body.

4,488,741

COMPRESSION COUPLING FOR SERVICE VALVE

Richard W. Conley, and Richard P. Tremblay, both of Pittsburgh, Pa., assignors to Kerotest Manufacturing Corp., Pittsburgh, Pa.

Filed Jan. 31, 1983, Ser. No. 462,469
Int. Cl.³ F16L *33/18*
U.S. Cl. 285—250 **4 Claims**



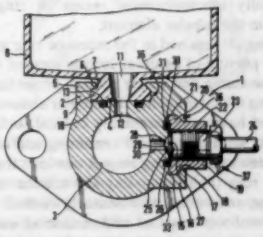
1. A plastic pipe coupling comprising,
a fitting having a plastic body portion with a bore for receiving a plastic pipe,
said fitting terminating in an end portion and said fitting bore including an internally threaded portion,
said fitting body portion having a recess adjacent said bore internally threaded portion to form an internal shoulder within said fitting,
an elastic deformable member positioned in said recess in surrounding relation with the plastic pipe,
a plastic nut having a plastic body portion with an internal bore including an internal wedge surface,
said nut body portion having an externally threaded portion engageable with said fitting bore internally threaded portion and terminating in an end portion to form a shoulder extending radially outwardly on said nut body portion,
said elastic deformable member including an annular gasket having one side abutting said fitting internal shoulder and an opposite side positioned to receive an axially directed force,
said gasket being compressed axially between said fitting body portion internal shoulder on said one side and said nut end portion on said opposite side upon advancement of said nut into said fitting bore,
said gasket being compressed on the pipe to effect a fluid tight seal around the pipe,
a plastic pipe-gripping collar having an external wedge surface complementary to and cooperating with said nut internal wedge surface so that said collar is positioned within said nut internal bore and surrounding the plastic pipe,
said collar having an internal wall with a roughened surface for frictionally gripping the plastic pipe,
said collar external wedge surface being formed by an enlarged end portion and a reduced end portion,
said nut surrounding said collar and said nut end portion extending beyond the end of said collar in said fitting bore,
said nut end portion having a bearing surface for applying a compressive force which is transmitted to said gasket opposite side to compress said gasket one side against said fitting internal shoulder,
said nut being threadedly advanced upon rotation to a stop point in said fitting bore where said nut body portion shoulder abuts said fitting end portion limiting the compression of said gasket to form a controlled seal around the pipe within said fitting,
said nut extending into said fitting bore to said stop point where said nut body portion shoulder abuts said fitting end portion to externally indicate the position of said nut in said fitting to obtain a preselected degree of compression of said gasket by said nut where the degee of compression of the gasket is limited by the abutment of said nut body portion shoulder with said fitting end portion thereby preventing excessive compression of said gasket,
said collar roughened surface being urged into frictional engagement with the pipe upon rotation of said nut to retain the pipe within said fitting, and
said collar enlarged end portion being removed from compressive relation with said elastic deformable member when said nut is advanced to said stop point such that compressive forces are applied to said elastic deformable member only by said nut end portion.

4,488,742

CONNECTING ARRANGEMENT, ESPECIALLY FOR TUBULAR ELEMENTS

Bernd Schopper, Hattersheim; Peter Tandler, Falkenstein, and Derek Lowe, Glashüetten, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Feb. 26, 1982, Ser. No. 352,409
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1981, 3112309
Int. Cl.³ F16L *37/26*
U.S. Cl. 285—325 **5 Claims**



1. Apparatus for connecting at least one fluid flow fitting onto a housing having a fluid bearing bore therein to provide communication between said fitting and said bore, said housing including a passage leading from said bore to the exterior of said housing, a shaped recess in said housing symmetrically disposed relative to said passage, said fluid flow fitting comprising an insert component having outwardly extending projections shaped to be matingly received in said recess in a slide fit relationship along a surface of said recess normal to said passage thereby to mount said fitting in said housing, said insert

component including a tapped bore therethrough for communicating with said passage, a frusto conic exit seat from said passage tapering outwardly to said surface, an externally threaded conduit adapted to be mated into said tapped bore, a conical beaded collar driven by a cap screw into said seat to lock said insert component against slide movement relative to said housing and providing a fluid transmission path from the housing bore to said conduit.

4,488,743

FLANGE CONNECTION FOR QUARTZ TUBES

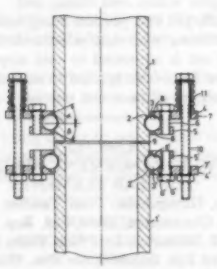
Karl A. Schülke, Neuberg, Fed. Rep. of Germany, assignor to Heraeus Quarzschmelze GmbH, Hanau, Fed. Rep. of Germany

Filed Jul. 26, 1982, Ser. No. 401,920

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1981, 3130680

Int. Cl.³ F16L *17/06*

U.S. Cl. 285—368 **20 Claims**



1. Flange connection for a tubular element (1) which comprises quartz material, comprising

an essentially circumferential recess or ring groove (2) formed in the tubular element;

a spring ring (3) retained in the recess or ring groove having a minor portion of its cross section located in the groove and a remaining and major portion projecting therefrom;

a flange ring (4) surrounding the tubular element, with clearance, and having an essentially conical surface (8) in engagement with part of said remaining and major projecting portion of the spring ring at one side thereof;

a counter ring (5) surrounding the tubular element, with clearance, and having an essentially conical surface (8) in engagement with part of said remaining and major projecting portion, and located opposite said one side of the projecting portion of the spring ring;

and clamping means (6) located beyond said projecting portion and clamping said flange ring and said counter ring onto the spring ring, with the remaining and major portion of the spring ring positioned between the flange ring and the counter ring, while securely holding the spring ring in said circumferential recess or ring groove (2) in the tubular element (1) and compressing the spring ring (3) radially inwardly.

4,488,744

CLAMP FOR JOINING TOGETHER A PAIR OF FLANGES

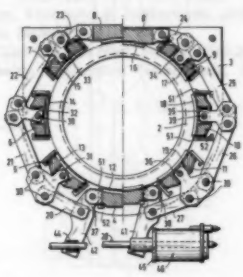
Friedrich Bubeck, Pforzheim, and Uwe Reimpell, Hanau-Wilhelmsbad, both of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Dec. 7, 1981, Ser. No. 328,352

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048903

Int. Cl.³ F16L *23/00*

U.S. Cl. 285—408 **8 Claims**



1. In a clamp for joining together a pair of flanges, the clamp having a multiple-link clamp chain, means for closing about the flanges and clamp shoes thereon, each clamp shoe having a wedge-shaped inner groove which, in the closed state of the clamp, straddles the edges of the flanges and, with the closing force of the chain means, presses them together, the improvement comprising: intermediate members for connecting respective clamp shoes to the chain means and means for pivotally joining the intermediate members both to the chain means and to the respective clamp shoes.

4,488,745

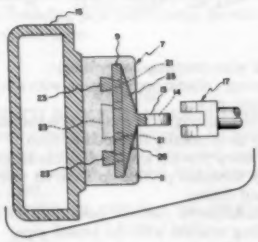
SUPPORTS FOR PLASTIC MOTOR VEHICLE BUMPERS

Vijay K. Stokes, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 4, 1983, Ser. No. 481,620

Int. Cl.³ B60R *19/02*

U.S. Cl. 293—155 **7 Claims**



1. A plastic vehicle bumper support attaching a plastic bumper to a metal frame of a vehicle, comprising:

a pad of metal including means for attaching said pad to said metal vehicle frame extending from and affixed to one face of said pad; and

a moldable thermoplastic matrix embedding said pad, except where said means for attaching said pad to said metal vehicle frame extends therethrough, the plastic matrix adjacent the other face of said pad being fixed to said plastic bumper and forming a plastic-to-plastic joint with said plastic bumper.

4,488,746

DOUBLE HAND WITH A THROUGH HOLE

Hajimu Inaba, Hino; Shinsuke Sakakibara, Kunitachi, and Ryo Nihei, Musashino, all of Japan, assignors to Fujitsu Fanuc Limited, Hino, Japan

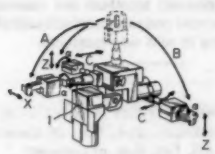
PCT No. PCT/JP81/00269, § 371 Date Jun. 4, 1982, § 102(e) Date Jun. 4, 1982, PCT Pub. No. WO82/01157, PCT Pub. Date Apr. 15, 1982

PCT Filed Oct. 7, 1981, Ser. No. 387,840

Claims priority, application Japan, Oct. 8, 1980, 55-142632[U]

Int. Cl.³ B66C *1/10*; B25J *15/00*

U.S. Cl. 294—86 R 2 Claims



1. A double hand for an industrial robot, comprising a stationary and a pressing hand unit, each hand unit comprising at least a pair of fingers and a plate member disposed between said hand units, said plate members being disposed in parallel with said fingers of said corresponding hand unit along the gripping center axis of said fingers, said pressing hand unit being flexibly connected to said stationary hand unit such that the respective gripping center axis of said two hand units are in alignment, said plate members of said pressing hand unit and stationary hand unit being disposed opposite to each other and the opening sides of the respective pairs of fingers of said stationary and pressing hand units being directed in opposite directions, wherein an opening is provided in each of said plate members to allow the workpiece to pass through said plate members coaxially with the respective gripping center axis of both said hand units.

4,488,747

METHOD AND FISHING TOOL APPARATUS FOR RECOVERING OBJECTS FROM WELLS

George Austin, P.O. Box 3143, Park City, Utah 84060

Filed Aug. 12, 1982, Ser. No. 407,446

Int. Cl.³ E21B *31/12*

U.S. Cl. 294—86.1 11 Claims

1. A fishing tool apparatus for retrieving objects from within a well, well bore, casing, and the like comprising:

a base sized to fit within the well, with a downhole side;

a plurality of electrodes with fusible tips, retractably mounted to the base and biased to extend the tips from the downhole side, said tips structured to displace and drag objects welded thereto in a manner minimizing snagging on the casing as the fishing tool is withdrawn;

means for running the base in and out of the well to bring the electrodes into contact with the object:

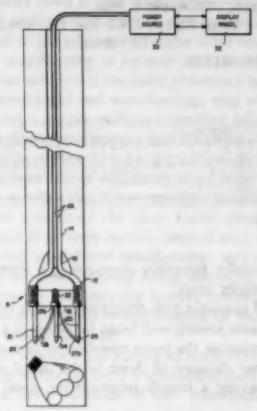
an electrical power source operably associated with the electrode tips to complete an electric circuit through at least one electrode tip and the object to fuse said tip to the object;

interface circuitry means operably associated with each electrode tip to generate impulses indicating when each electrode tip contacts the object; and

a control panel having:

(a) display means in communication with the interface circuitry means to emit audio or visual signals in response to the impulses; and

(b) switching means having a first mode associated with the power source and interface circuitry means to activate said interface circuitry means, and a second mode associated with the power source and electrodes to



selectively activate at least one welding tip to weld to the object.

4,488,748

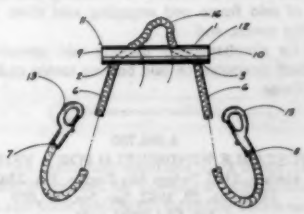
SKI/POLE CARRIER APPARATUS

Marc Burkes, 4605 Alexander Dr., Metairie, La. 70003

Filed May 10, 1982, Ser. No. 376,531

Int. Cl.³ A63C *11/02*

U.S. Cl. 294—147 2 Claims



1. A ski carrier apparatus, comprising:

a. a flexible rope having a lock means at each end thereof;

b. an elongated tubular handle provided with:

i. longitudinal slots on a bottom portion at opposite ends of said handle, said handle being adapted to receive said rope from its opposite open ends, and said slots being adapted to secure said rope within said handle;

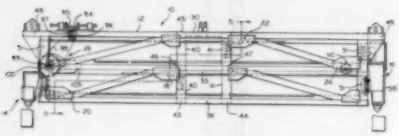
ii. a pair of linearly spaced apart apertures on an upper side of said handle equidistantly located from the center of said handle, a distance between said apertures being less than a distance between the innermost ends of said slots, said apertures being adapted to receive said rope from within said handle, so that said rope extends upwardly from said handle and forms a loop above the top side of said handle, the minimum length of said loop being the distance between said apertures.

4,488,749

SPREADER ASSEMBLY

Richard F. Voelz, Butler, Wis., assignor to Renner Manufacturing Company, Milwaukee, Wis.

Filed Sep. 3, 1982, Ser. No. 414,610
Int. Cl.³ B66C *1/00*
U.S. Cl. 294—815 F **3 Claims**



1. A spreader assembly comprising a frame and first and second spreader arms,

each said spreader arm comprising a pair of beam members and means joining said beam members in a parallel spaced-apart relation, the beam members of one arm being spaced the same distance as those of the other, said beam members having a length substantially equal to that of said frame,

each beam member having a pair of vertically spaced-apart rail means,

said frame having first, second, third and fourth pairs of bearing means,

said first and second pairs of bearing means being disposed above the horizontal center of said frame and on one side of the vertical center thereof, said third and fourth pairs of bearing means being disposed below the horizontal center of said frame and on the other side of the vertical center thereof, said first and third pairs of bearings being disposed on said frame closer to the vertical center thereof than said second and fourth pairs of bearing means and said second and third pair of bearing means being closer to the horizontal center of said frame than said first and fourth bearing means,

said first spreader arm extending through one end of said frame and engaging said first and second bearing means and said second spreader arm extending through the other end of said frame and engaging said third and fourth bearing means, and

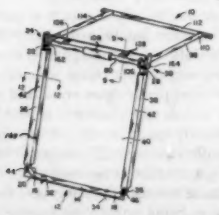
means for simultaneously moving said spreader arms in opposite directions on said bearing means and relative to said frame.

4,488,750

ADJUSTABLE WINDSHIELD FOR A VEHICLE

Curtis E. Gerber, 1115 Twiggs St., Tampa, Fla. 33602

Filed Sep. 29, 1982, Ser. No. 427,609
Int. Cl.³ B60J *1/04*
U.S. Cl. 296—78 R **32 Claims**



1. An adjustable windshield for a vehicle, comprising in combination:

a first upright;

a second upright disposed in spaced parallel relationship to said first upright;

a first channel member removably connected to said first upright;

a second channel member removably connected to said second upright;

a windshield secured to and extending between said channel members;

a first side member disposed coplanar with and connected to said first upright;

a second side member disposed coplanar with and connected to said upright, said second side member being parallel to said first side member; and

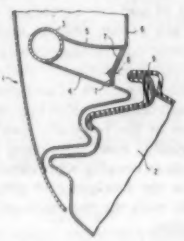
means for moving said windshield from a first position in which said channel members are connected to said uprights to a second position in which said channel members are connected to said side members.

4,488,751

LATERAL PROTECTION FOR MOTOR VEHICLES

Günter Kling, Böblingen, Fed. Rep. of Germany, assignor to Daimler-Benz AG, Fed. Rep. of Germany

Filed Dec. 21, 1982, Ser. No. 451,813
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1981, 3151861
Int. Cl.³ B60J *5/04*
U.S. Cl. 296—146 **8 Claims**



1. An assembly providing lateral protection for motor vehicles having doors, with lower portions configured to be generally complementary to door threshold bearer portions of the motor vehicle, comprising means disposed inside of each vehicle door extending generally in the longitudinal direction of the vehicle for reinforcement, said means including a hollow bearer and a plurality of web plate means having different bending-resistances for supporting said hollow bearer relative to an inner door panel of the respective door, said means for reinforcing disposed in a manner directing the force flow originating therefrom, in the event of a lateral impact, in the direction of the threshold bearer portion.

4,488,752

EXPANDABLE MOBILE TRAILER

Alphe Broussard, 64 Avenue Mohamed Diouri, Kenitra, Morocco

Filed Jul. 30, 1982, Ser. No. 403,323
Int. Cl.³ B60N *3/34*
U.S. Cl. 296—171 **15 Claims**

1. An expandable mobile trailer comprising:

(A) a relatively rigid main body portion having a floor structure and substantially opposite pairs of vertical side and end walls above the floor;

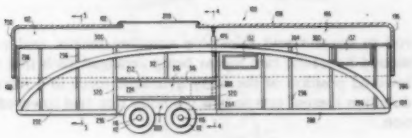
(B) two parallel arch beams located inside of the main body portion, each of the arch beams being positioned adjacent to and affixed to one of the vertical side walls of the main body portion;

(C) a plurality of vertical structural tension members affixed at spaced intervals to the outer portions of each of the two

arch beams, the floor structure being suspended in tension from the lower ends of the vertical structural tension members;

(D) at least two vertical support structural members on each side of the main body portion, the lower ends of each set of the vertical support structural members being attached to the central portion of the edges of the floor structure, the central portion of the each arch beam being mounted on the upper end of each set of the vertical support structural members, thereby the vertical support structural members being in compression, and the vertical support structural members having substantially more structural tension, flexural and compression strength than the vertical structural tension members;

(E) the floor of the main body portion having a wheel well opening on each side between the two sets of vertical support structural members;



(F) two wheel means which each includes at least one wheel, each of the wheel means being positioned in one of the wheel well openings and mounted on each end to the floor structure between one set of the vertical support structural members, the wheel of each of the two wheel means being movable in a horizontal line which is parallel to the line travel of the trailer;

(G) a relatively rigid upper body section having a roof structure and substantially vertical side and end walls corresponding, respectively, to and positioned outside of the side and end walls of the main body portion, and being telescopically associated with the main body section; and

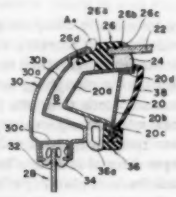
(H) means reacting between the main body section and the upper body section for raising and lowering the upper body section with respect to the main body section in the telescopically associated relationship.

4,488,753

VEHICLES FOR EFFECTING A SEAL

Shyouichi Koike, Sagamihara, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 29, 1981, Ser. No. 335,335
Claims priority, application Japan, Dec. 29, 1980, 55-188369
Int. Cl.³ B62D *27/04*
U.S. Cl. 296—201 **13 Claims**



1. A vehicle body, comprising:

a front hinge pillar;

a windshield having a lateral edge portion bonded to said front hinge pillar;

a side door having a door frame formed from panel members located adjacent said front hinge pillar; and

a windshield weatherstrip mounted to said front hinge pillar, said weatherstrip being T-shaped in cross section and including a base portion extending to engage the front hinge pillar and the lateral edge portion of said windshield, a lip portion extending from said base portion to contact and overlie the outer surface of the lateral edge portion of said windshield, said lip portion having an outer surface tapered toward said windshield to terminate in a pointed end on the windshield so that transition from the outer surface of the windshield to the outer surface of the windshield weatherstrip is smooth and uninterrupted to obtain laminar air flow at the point of contact between and about the windshield and weatherstrip, said weatherstrip further having a tongue portion extending from said base portion in a direction opposite said lip portion;

the door frame panel members having a forward end portion overlying a front end of said front hinge pillar where the windshield weatherstrip base portion is mounted, the forward end portion of the door frame panel members being engaged at an inner surface thereof with said tongue portion of said windshield weatherstrip; said door frame also having an outer surface being smoothly curved to extend forwardly and laterally inward toward the windshield to generally form a continuation of the outer surface of the windshield; and

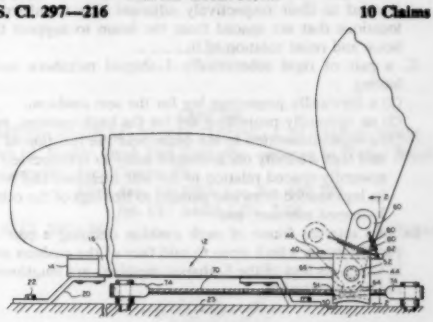
said windshield weatherstrip having an outer surface extending generally smoothly over a substantial portion thereof between the outer surfaces of said windshield and said door frame.

4,488,754

SEAT BELT ANCHORING APPARATUS

Max O. Heesch, Brooklyn, and Harold G. Scholin, Jackson, both of Mich., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jul. 2, 1982, Ser. No. 394,680
Int. Cl.³ B60R *21/10*
U.S. Cl. 297—216 **10 Claims**



1. A seat belt anchoring apparatus for a motor vehicle, in which the seat is mounted for fore and aft adjustment through the use of a seat track mechanism including a stationary lower seat track affixed to the floor of the vehicle and an upper track bearing the seat slidably relative to the lower track, a seat belt holder comprising a pivotal lever, a bracket pivotally securing the lever to the upper seat track for movement therewith, means normally maintaining said lever in a first position a cam face mounted on said lever for progressive excursion on pivotal movement of the lever, a cable, means affixing said cable to the vehicle floor and spaced therefrom adjacent to and out of physical contact with the cam face when the lever is in its first position, the cable having a generally taut condition generally spaced from the cam face a like distance regardless of the position of the cam face along the cable, said bracket including a clamp receiver secured to said upper seat track and positioned adjacent said cable on the side of the cable opposite said cam face, said lever pivotally movable out of said first position to a clamp position in response to a crash level force acting on said seat belt, the cam face advanced by the pivotal movement of said lever to engage said cable in clamp position

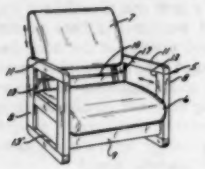
to jam said cable against said clamp receiver and anchor said seat against fore and aft movement relative to the vehicle floor.

4,488,755

CHAIR WITH REVERSIBLE SEAT AND BACK CUSHIONS

Leonard M. Nemschoff, Sheboygan, Wis., assignor to Nemschoff Chairs, Inc., Sheboygan, Wis.

Filed Sep. 20, 1982, Ser. No. 419,804
Int. Cl.³ A47C 7/00
U.S. Cl. 297—443 **6 Claims**



1. A seating unit comprising opposite upright side members that are rigidly connected in laterally spaced relation to one another, a seat cushion having a rear face, and a back cushion having a bottom face, each of said cushions having a substantially rigid internal frame, said seating unit being characterized by:

A. a laterally extending beam having opposite ends adjacent to the respective side members;

B. a plate-like connecting member rigidly secured to each end of the beam and projecting in a direction normal to the length of the beam, said connecting members being secured to their respectively adjacent side members at locations that are spaced from the beam to support the beam and resist rotation of it;

C. a pair of rigid substantially L-shaped members, each having

(1) a forwardly projecting leg for the seat cushion,

(2) an upwardly projecting leg for the back cushion, and

(3) a rigid connection to the beam near the junction of its said legs whereby the L-shaped member is supported in inwardly spaced relation to the side members and with its legs spaced from and parallel to like legs of the other L-shaped member; and

D. said internal frame of each cushion defining a pair of parallel bores which open to said face of the cushion and in which its legs of the L-shaped members are lengthwise slidably receivable.

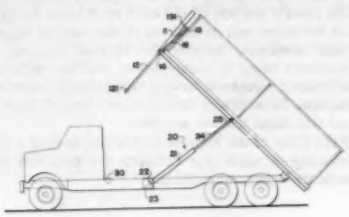
4,488,756

APPARATUS FOR ELEVATING A TRUCK BODY

Lew Dalman, Box 261, Baldur, Manitoba, Canada R0K 0B0

Filed Jan. 31, 1983, Ser. No. 462,685
Claims priority, application United Kingdom, Feb. 4, 1982, 8203184
Int. Cl.³ B60P 1/16
U.S. Cl. 298—19 B **6 Claims**

1. An apparatus for elevating a truck body, of the type which is pivotal relative to the truck chassis about an axis at the rear of the body, comprising first hydraulic ram means having a cylinder and ram rod, means for mounting the cylinder on the body at the front thereof for pivotal movement, such that the ram rod extends downwardly for contacting the chassis, means for releasably coupling the ram rod to the chassis, means for extending the first hydraulic ram means such that the full extension thereof elevates the body from a lowered position on the chassis to a partly elevated position, a pair of second double-acting hydraulic ram means, means for directly coupling the pair of second hydraulic ram means to the chassis and to the body at transversely spaced positions intermediate the first hydraulic ram means and the pivot axis, means for extending the second hydraulic ram means whereby full extension thereof elevates the body from said partly elevated position to a fully elevated position in which the ram rod is separated from said chassis, and means for limiting the pivotal movement of said cylinder whereby lowering of said body causes the ram



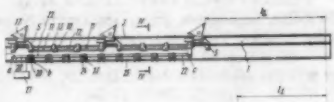
rod to contact said releasable coupling means, said pair of second hydraulic ram means being arranged such that in the lowered position of the body hydraulic force in a retraction direction thereof acts to bias the body into said lowered position.

4,488,757

PLOUGH MINING INSTALLATION

Nikolai V. Karmyshin; Evgeny I. Kudryashov; Vladimir M. Orlov; Vladimir M. Levashov; Vladimir N. Khorin, and Alexandr D. Antonov, all of Moscow, U.S.S.R., assignors to Gosudarstvenny Proektno -Konstruktorsky I Eksperimentalny Institut Ugolnoi Promyshlennosti, Moscow, U.S.S.R.

Filed Apr. 21, 1983, Ser. No. 486,993
Int. Cl.³ E21C 29/02, 27/40
U.S. Cl. 299—32 **8 Claims**



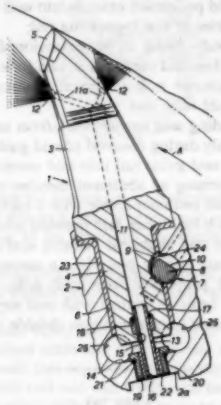
1. A plough mining installation comprising a frame; guide means attached to said frame; a plurality of plough bodies mounted on said guide means; longitudinal members interlinking said plough bodies into a ploughing system capable of being reciprocated back and forth along the face of the frame by a reciprocatory means; said reciprocatory means causing said ploughing system to reciprocate back and forth along said face, said means incorporating at least one hydraulic ram immovably attached to said frame, a plurality of movable hydraulic rams and additional guide means attached to said frame along the side thereof opposite said ploughing system; said movable hydraulic rams comprising said plurality being spaced apart along said frame and being linked to each other by articulated joints, an extreme movable hydraulic ram being pivotally linked to the movable member of said immovable hydraulic ram and the other extreme movable hydraulic ram being pivotally linked to said ploughing system; slides giving support to said articulated joints between said movable hydraulic rams, said slides being movably mounted on said additional guide means.

4,488,758

PICK AND THE COMBINATION OF A PICK AND HOLDER

Raymond J. Clemmow; Leonard Radford, and John D. Thorpe, all of Sheffield, England, assignors to Padley & Venables Limited, Sheffield, England

Filed Nov. 18, 1981, Ser. No. 322,451
Claims priority, application United Kingdom, Nov. 24, 1980, 8037567
Int. Cl.³ E21C 35/22; E21B 10/18
U.S. Cl. 299—81 4 Claims



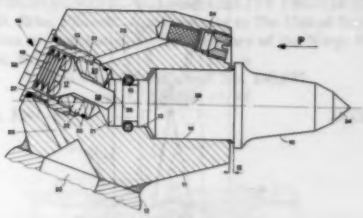
1. The combination of a mineral mining pick and a pick holder, said pick comprising: a body having a head with a cutting part and an outlet port; a shank which extends longitudinally from said head; and passage means in said body for the flow of fluid under pressure therethrough to said outlet port by which fluid is directed for dust suppression, cooling or flushing purposes; said holder comprising a shank socket within which said shank is longitudinally received; holding means for being releasably retained within said shank for holding said shank within said socket; said pick body having a fluid supply passage communicating with said passage means; said pick holder including a tubular spigot extending longitudinally of said shank socket and having a bore which is in fluid flow communication with said fluid supply passage; said pick shank having a fluid coupling socket in fluid flow communication with said passage means in said pick body; said fluid coupling socket in said pick having annular seating means therein; annular fluid pressure sealing means seated in said annular seating means in said pick; means longitudinally retaining said sealing means in said annular seating means; said sealing means having a bore; said tubular spigot extending axially completely through said bore in said sealing means and said sealing means being radially flexible to radially engage and seal said axially extending spigot to form a radial seal which, with the shank held in the socket, is independent of the axial position of said pick shank relative to said spigot and independent of relative axial movement between said sealing means and said tubular spigot and is thereby independent of any axial compressive force applied by said retaining means to provide sealed fluid flow communication between said fluid supply passage and said passage means in said pick body to maintain the seal to accommodate relative axial or radial movement between said tubular spigot and said fluid coupling socket in said pick shank, said sealing means is responsive to back pressure in said fluid coupling socket to increase sealing engagement with the spigot, said tubular spigot being resiliently mounted in said holder to be capable of deflecting to accommodate for misalignment between itself and said fluid coupling socket during coupling therewith.

4,488,759

DEVICE FOR SUPPLYING FLUID TO A TOOL FOR BREAKING HARD MATERIAL

Sven A. Bergqvist, Sandviken, Sweden, assignor to Santrade Ltd., Lucerne, Switzerland

Filed Feb. 25, 1983, Ser. No. 469,742
Claims priority, application Sweden, Mar. 10, 1982, 8201491
Int. Cl.³ E21C 35/22
U.S. Cl. 299—81 12 Claims



1. A device for supplying fluid to a tool for breaking hard material, such as coal, said tool being rotatably and axially limitedly movably carried by a holder, valve means provided for supplying fluid to a nozzle when the tool is displaced axially rearwards during operation, said nozzle being arranged proximate to said tool, a valve arranged to be opened in response to axial rearward displacement of said tool to direct fluid to said nozzle, said valve including valve slide means for providing a rotary torque acting on the tool about the longitudinal axis thereof in response to axial rearward displacement of the tool.

4,488,760

METHOD OF MANUFACTURING A BUSHING TOOL

Karl M. Weiler, Buck Hill Falls, Pa., assignor to Weiler Brush Company, Inc., Cresco, Pa.

Filed Jan. 20, 1983, Ser. No. 459,289
Int. Cl.³ A46B 3/00, 7/08
U.S. Cl. 300—21 2 Claims

1. A method of manufacturing a brushing tool, comprising the steps of:

(a) perforating a circular disc with a plurality of circumferentially disposed holes adjacent the rim thereof,

(b) providing a plurality of notches in the rim of the disc at approximately uniformly-spaced locations so that each notch is adjacent and in radial alignment with a hole,

(c) passing wire bundles through each perforation and twisting the bundles to form an eye so as to anchor the bundles in each perforation,

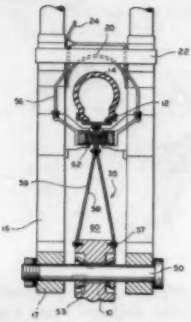
(d) partially seating the eye in the notch adjacent and in alignment with the perforation, and

(e) providing means for coupling the disc to drive means for imparting rotary motion to the plate.

4,488,761
WHEEL DISC BRAKE

Erik F. Buell, Milwaukee, Wis., assignor to Harley-Davidson Motor Co., Inc., Milwaukee, Wis.

Filed May 10, 1982, Ser. No. 376,533
Int. Cl.³ B60B *3/02, 3/14, 3/16*
U.S. Cl. 301—6 E 7 Claims

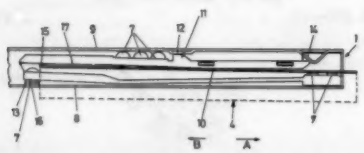


1. A vehicle wheel and brake assembly comprising a hub, a rim for supporting a tire, a tire supported by said rim, a disc intermediate said hub and said rim and connecting same, an air space in said disc adjacent said hub, friction brake means constructed and arranged to selectively engage said disc at an area near said rim to apply braking forces thereto, said disc comprising two symmetrical disc halves which converge toward one another and contact one another in said area rear said rim.

4,488,762
DRAWER GUIDE ASSEMBLY

Erich Röck, Höchst, Austria, assignor to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed May 26, 1982, Ser. No. 382,351
Claims priority, application Austria, Jul. 13, 1981, 3073/81
Int. Cl.³ A47B *88/16*
U.S. Cl. 312—348 2 Claims



1. A pull out guide assembly for use on each of opposite sides of a drawer or the like in an article of furniture of the type wherein the drawer or the like is slidably insertable into and removable from a furniture body, said assembly comprising:

a supporting rail adapted to be fastened to one of the drawer or the like or the furniture body;

a guide rail adapted to be fastened to the other of the drawer or the like or the furniture body, said guide rail including a load transmitting flange;

at least two rollers positioned between and in rolling contact with said guide and supporting rails and providing exclusive load transmission therebetween, said rollers being spaced from each other longitudinally of said rails;

said rollers being mounted on opposite sides of said load transmitting flange by means of a carrier which is movable with respect to said supporting and guide rails during normal sliding movement of the drawer or the like;

said carrier comprising an elongated body formed of a material enabling bending of said body in a direction transverse to the longitudinal direction thereof and of said rails;

means for, upon the drawer or the like being removed completely from the furniture body, preventing said carrier from being removed from said supporting rail upon removal of said guide rail therefrom, said preventing means comprising a projection extending from one side of said carrier and adapted to extend through a hole in said supporting rail, and a pressure member extending from an opposite side of said carrier and adapted to abut a stop member on said supporting rail, thereby to tilt said carrier such that said projection extends into said hole, thus locking said carrier in said supporting rail;

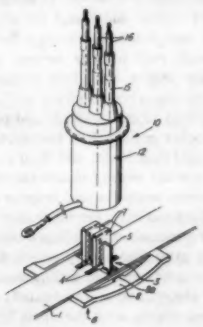
said carrier body being in an untensioned and non-bent condition when said carrier is in said locked position and when said carrier is in a normal position slidable with respect to said rails; and

means for bending said carrier body from said untensioned condition only during removal of said guide rail from and insertion of said guide rail into said carrier, said bending means comprising an abutment member extending from said guide rail and cooperable with a surface of said carrier body such that when said pressure member abuts said stop member said abutment member acts on said surface and bends said carrier body by an amount sufficient to remove said projection from said hole, said abutment member not being in contact with said surface when said carrier is in said normal position slidable with respect to said rails.

4,488,763
FLAT ELECTRICAL CABLE

Friedhelm Ritter, Gilching, Fed. Rep. of Germany, assignor to Raychem Corporation, Menlo Park, Calif.

Filed Apr. 22, 1981, Ser. No. 256,574
Claims priority, application United Kingdom, Apr. 22, 1980, 8013263
Int. Cl.³ H05K *1/00*
U.S. Cl. 339—17 F 3 Claims



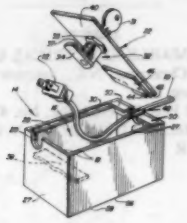
1. An electrical interconnection arrangement comprising a multi-conductor flat cable having conducting elements and electrical insulation, said cable having at least one region formed into an upstanding fold in which the respective conducting elements are pressed into contact with themselves to provide a group of transversely adjacent connecting pins, and reinforcing means bonded to respective portions of the cable insulation on each side of the fold thereby to secure said portions together in fixed spatial relationship to each other, said reinforcing means providing at least one substantially rigid upstanding peg that passes through the cable adjacent the conducting elements.

4,488,764

PORTABLE SECURITY CONTAINER FOR AN ELECTRICAL CORD AND ATTACHED PLUG

Bruno A. Pfenning, and Doris P. Pfenning, both of 520 Hummingbird La., Deerfield, Ill. 60015

Filed Jul. 12, 1982, Ser. No. 397,489
Int. Cl.³ H01R *13/514*
U.S. Cl. 339—37 **4 Claims**



1. An apparatus for preventing unauthorized use of an electrical cord and attached plug wherein said use includes connecting the plug to an electrical receptacle, said apparatus comprising:

(a) a container having a geometric shape of a generally right rectangular parallelpiped with height, length, and width dimensions;

said container comprising a plurality of walls including two opposed sidewalls, two opposed end walls, and a bottom wall that together define a storage volume;

said sidewalls and said end walls each having a top edge, said top edges defining an opening to said storage volume;

at least one of said walls having a support shoulder;

one of said walls including a locking catch extending into said storage volume;

one of said walls that is opposite said wall that includes said locking catch having at least one retaining plate extending into said storage volume opposite said locking catch, said retaining plate having a top surface generally aligned with said support shoulder;

each wall of at least one of the pairs of opposed walls defining at least one slot that is open to the top edge of that wall, said slot being of a size and configuration to prevent the passage of the electrical plug while being large enough to allow the passage of the electrical cord through the slot;

(b) a cover comprising a generally rectangular plate having first and second ends and including a key-operated lock mounted to said cover adjacent said first end of said cover;

said key-operated lock including a cylinder with a portion of said cylinder protruding through said cover adjacent said first end of said cover, said key-operated lock further having a rotatable arm on the end of said protruding portion and extending laterally therefrom;

said cover further defining a bottom surface and a latching edge along said second end of said cover, said cover further having a tab extending outwardly of said latching edge, said cover further including a flange parallel to and below said bottom surface and extending outwardly of said latching edge of said cover on at least one side of said tab

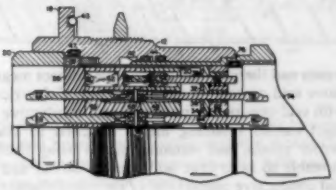
whereby a portion of the cord can be disposed within one of said wall slots, the plug can be placed within said storage volume of said container, and said container can be locked to prevent unauthorized use of the plug by disposing said cover in a closed position on said container over said opening with a peripheral portion of said bottom surface supported on said support shoulder, with said cover fitting flush against said top edges of said container walls, with said key lock arm engaged under said locking catch, with said flange engaged under said retaining plate, and with said tab extending over one of said wall slots and whereby said cover can be subsequently temporarily removed to permit the plug to be located exterior of said container with a portion of the cord extending through said storage volume and through two of said slots after which said cover can again be locked in said closed position on said container to thereby retain said container on the cord while permitting use of the plug.

4,488,765

DEAD-FACED ELECTRICAL CONNECTOR WITH ELECTROMAGNETIC VULNERABILITY PROTECTION

Alfred R. Erbe, Phoenix, Ariz., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 18, 1980, Ser. No. 160,697
Int. Cl.³ H01R *13/44*
U.S. Cl. 339—42 **23 Claims**



1. In an electrical connector of the type wherein an electric current is continued over n conductor paths, where n is an integer, through engaged contacts of a mated electric plug and receptacle, in said receptacle, the improvement comprising:

a metallic encasement having a metallic generally closed end and a rear portion, said metallic closed end having n+1 apertures therein for providing ingress of n male pin contacts and an actuator means;

n electrical conductors mounted within said encasement and substantially enclosed thereby;

a movable insulator assembly supported in said metallic encasement;

n intermediate electrical contacts supported by said insulator assembly and aligned with said n apertures;

means for biasing said insulator assembly towards said generally closed end when said receptacle is unmated from said electric plug such that said n apertures are covered and closed by said n intermediate contacts to completely close said generally closed end and such that said n electrical conductors are disconnected from said n intermediate contacts; and

means responsive to ingress of said actuator means within said metallic encasement for moving said insulator assembly towards said rear portion such that said n intermediate contacts electrically connect with said n electrical conductors.

4,488,766

HIGH DENSITY ZERO INSERTION FORCE CONNECTOR

Nicola Cosmo, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 30, 1982, Ser. No. 429,360
Int. Cl.³ H01R *13/38*; H05K *1/12*
U.S. Cl. 339—75 MP **10 Claims**

1. A high density circuit board edge connector assembly, comprising:

an insulative housing;

conductive posts projecting from said housing;

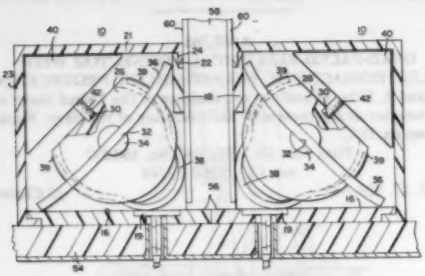
a circuit board having conductive strips contained thereon, receivably received by said housing;

contact carrier means disposed in said housing for urging a conductive contact means retained by said carrier means

into or out of electrical contact with said conductive post and said conductive strips;

conductive contact means disposed on said carrier means providing wiping electrical communication between said post and said strip;

camming means disposed in said housing and engaging said contact carrier means thereby moving said contact carrier



means and thereby said conductive contact means so as to move said contact means into or out of electrical contact with said conductive posts and said conductive strip; and

contact carrier retaining means attached to said contact carrier means, said retaining means being resiliently deformable so as to urge said contact carrier and therefore said conductive contact out of electrical contact with said conductive post and said conductive strip.

4,488,767

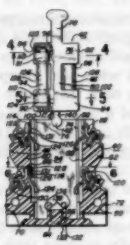
REJECTION TYPE FUSE HOLDER

Lewis M. Lehman, Brown Deer, and Joseph J. Gribble, Milwaukee, both of Wis., assignors to Square D Company, Palatine, Ill.

Continuation of Ser. No. 244,449, Mar. 16, 1981, abandoned. This application May 4, 1983, Ser. No. 491,497

Int. Cl.³ H01R *19/48*

U.S. Cl. 339—91 R **8 Claims**



2. A fuse holder system for a cartridge rejection type fuse with the fuse having a length and diameter provided by a cylindrical body and cylindrical metallic terminals at opposite ends of the body and including a rejection feature provided by a cylindrical metallic projection extending axially from an end of one of the cylindrical terminals with the cylindrical projection having a diameter smaller than its associated cylindrical terminal, said system comprising:

a receptacle providing a substantially rectangular socket extending between a substantially closed rear end and an open front end of the receptacle, and

a fuse holder molded as a unitary part of insulating material and having a portion receivable in the socket with said portion including a cavity having a pair of insulating end walls and a pair of insulating side walls extending between each end wall with the side walls associated with one of the end walls engageable with the said one terminal to position and maintain a fuse having a rejection feature in the cavity and a fuse rejection feature including a rigid insulating portion molded integrally with the said one end wall sized and located to provide a path of such selected width as to allow passage therethrough of the cylindrical projection into a fully installed position but to exclude passage therethrough of one of said cylindrical terminals by reason of the greater diameter of the cylindrical terminal than that of the cylindrical projection.

4,488,768

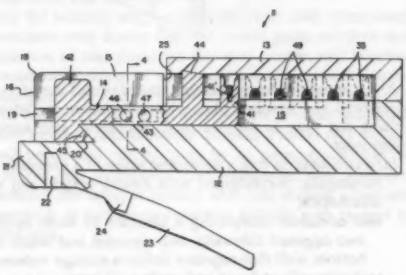
PROGRAMMABLE ELECTRICAL CONNECTOR

Ned A. Sigmon, Clemmons, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 28, 1983, Ser. No. 470,347

Int. Cl.³ H01R *23/04, 29/00*

U.S. Cl. 339—99 R **11 Claims**



1. An electrical connector for use with laterally spaced wires, said connector comprising an insulating housing body having a wire connecting face at which said laterally spaced wires are to be positioned and a contact face, a series of terminal-receiving compartments extending longitudinally in side-by-side relation between the wire connecting face and the contact face, and a group of terminals, each having a wire connecting portion and a contact portion integrally joined by an intermediate portion, the respective intermediate portions being of mutually different lengths so that the terminals are selectively receivable in different compartments with the contact portions located at the contact face and the wire connecting portions located at the wire connecting face in staggered relation to provide various alternative wire connection points a different one of said wires being connected to the terminal located in any one of said compartments depending on which one of said different length terminals is received therein.

4,488,769

MODULAR PLUG

Werner Feigl, Diedorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 11, 1983, Ser. No. 483,880

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1982, 3216217

Int. Cl.³ H01R *13/58*

U.S. Cl. 339—103 M **2 Claims**

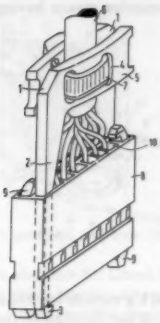
1. For use with a modular plug of the type which has a forward surface and parallel rows of contact chambers extending rearwardly of said forward surface with contacts in at least some of the chambers as necessary except for diagonally opposite chambers of two separate rows, and which has a plurality of conductors of a cable connected to respective contacts, a strain relief for the cable comprising:

a pair of L-shaped inserts each including an elongate member and a cross member,

each of said elongate members including a hook at its distal

end and sized to be received through an empty contact chamber so that said hook engages against said forward surface to latch and prevents rearward movement of said insert, and

means defining spaced apertures through said cross member of each of said inserts so that when both inserts are latched



in the respective empty contact chambers with the cross members extending in mutually opposite directions some of said apertures of both inserts are generally opposite one another on opposite sides of the cable; and

a cable strap for extending through the opposed apertures to secure the cable.

4,488,770

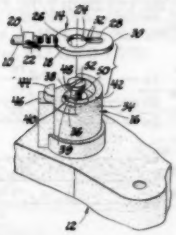
SCREW-DOWN POST TERMINAL

Hoi Lui, Cortland, Ohio, and Benjamin F. Brinn, Jr., Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 27, 1983, Ser. No. 489,073

Int. Cl.³ H01R *4/30*

U.S. Cl. 339—263 R **2 Claims**



1. A screw-down post terminal for making an electrical connection to a ring terminal having a keyhole comprising:

a dielectric post having a conductor disposed therein so that the conductor has an exposed end for contacting the ring terminal,

a screw-down device for clamping the ring terminal against the exposed end of the conductor, said screw-down device comprising a head and a shank which connects the head to the conductor,

and positive means on the dielectric post for angularly positioning the ring terminal comprising a raised arcuate shroud and a raised stop spaced from each circumferential end of the raised arcuate shroud,

said raised arcuate shroud being radially spaced from the shank of the screw-down device so that the shank is fully disposed in the slot portion of the keyhole when the ring terminal contacts the conductor, and

said raised stop being radially spaced from the shank so that the raised stop is disposed in another portion of the keyhole to angularly position the ring terminal.

4,488,771

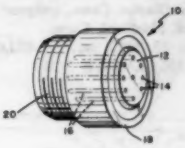
FLUOROSILICONE ELASTOMERS, METHOD OF MAKING SUCH ELASTOMERS AND ELECTRICAL CONNECTORS INCLUDING THE ELASTOMERS

Stuart K. Koford, Lombard, Ill., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Mar. 8, 1982, Ser. No. 355,819

Int. Cl.³ H01R *3/00*

U.S. Cl. 339—278 D **12 Claims**



1. In an electrical connector comprising an outer housing, an insert within said housing and having aperture means therein and electric contact means in communication with said aperture means, the improvement comprising:

said insert being formed of an elastomeric material comprising a two-phase composition formed of an organosilicone polymer having dispersed therein a telomer of an organofluoro compound selected from the group consisting of perfluorinated hydrocarbons, said telomer being present in solid particulate form and having a particle size in the range of about 1 to 10 microns prior to processing.

4,488,772

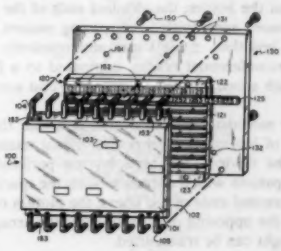
ELECTRO-OPTIC INDICATING DEVICE

Thomas Georgopulos, Clearwater, Fla., and Thomas A. Cioper, Rolling Meadows, Ill., assignors to GTE Automatic Electric Inc., Northlake, Ill.

Filed Sep. 2, 1982, Ser. No. 414,199

Int. Cl.³ G02F *1/13*; H04M *1/26*

U.S. Cl. 350—331 R **4 Claims**



1. An electro-optic indicating device for use in a multi-line telephone instrument for displaying line status information responsive to a control voltage applied to the indicating device when one or more lines are in use; said electro-optic indicating device comprising:

a liquid crystal display including a layer of liquid crystal material contained between first and second transparent slides, said first slide including a first electrode and said second slide including a second electrode, said first and second electrodes arranged to receive said control voltage;

information display means located under said liquid crystal

display comprising an information holder having a plurality of walls extending from a face thereof, said walls forming a plurality of information receiving areas arranged to receive a plurality of information strips having information to be displayed printed thereon, said information display means normally occulted; and

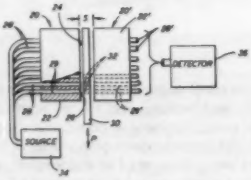
switching means for applying said control voltage to said first and second electrodes changing the optical property of said liquid crystal material rendering said information display visible.

4,488,773

OPTICAL FIBER POSITION SENSOR

Robert A. Wagner, Manchester, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 23, 1982, Ser. No. 452,674
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.20 **5 Claims**



1. An optical fiber position sensor comprised of a planar-faced device for transmitting an optical signal and a mating planar-faced device for receiving the optical signal, each device having an identical array of a multiplicity of fibers, the devices positioned so that the planar face of each opposes the other across a gap;

each device comprised of a holder having a planar face and a plurality of metal surfaced interior channels; glass optical fibers coated with a first metal contained within said channels with their planar terminal ends spaced apart in a spacing pattern along the planar face of the holder; a cast and solidified second metal contained within the channels and completely surrounding the fibers, the second metal wetting and adhering to both the first metal and the metal surface of the holder; the terminal ends of the fibers precisely spaced apart within the spacing pattern to a tolerance of less than ±0.003 mm and relatively free from small circumferential cracks, compared to a like device made with a cast polymer instead of a cast second metal; and

a movable modulator plate positioned within the gap and capable of intercepting an optical signal transmitted between the devices, the plate having perforations on a spacing pattern which correlates with the spacing pattern of the terminal ends of the fibers, the motion of the plate varying the opposing pairs of fibers in the arrays through which light can be transmitted.

4,488,774

SIDE REFLECTOR ASSEMBLY

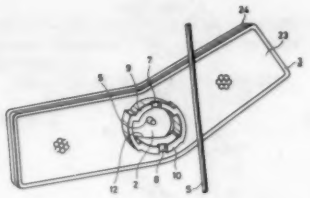
Joe Kagayama, Osaka, Japan, assignor to Tsuyama Mfg. Co., Japan

Filed Aug. 27, 1981, Ser. No. 296,831
Claims priority, application Japan, Aug. 30, 1980, 55-120546; Dec. 18, 1980, 55-182795[U]
Int. Cl.³ G02B 5/12
U.S. Cl. 350—99 **7 Claims**

1. A side reflector assembly, designed to be mounted on the spoke of a wheel, comprising: a reflector means provided on one face of the side reflector assembly said face having a bottomed, round aperture which is opened forward; and a cylindrical connector means coaxially fitted into the bottomed, round aperture;

said bottomed, round aperture provided in the leading edge of the periphery thereof with a pair of notches for receiving a wheel spoke, and provided, on the inner wall thereof adjacent to said notches, with thicker wall portions so as to uniformly reduce the inner diameter of the aperture;

said cylindrical connector means having a rearwardly extending bifurcated leg portion for retaining a wheel spoke, and a having lateral piece extending outwardly from both ends of said leg portion; and



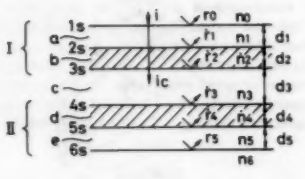
said cylindrical connector means inserted at the leg portion in said bottomed round aperture across a wheel spoke passing through said notches, and rotated in coaxial relation to the spoke and the reflector means, whereby the front faces of both lateral pieces are irreversibly slidable with respect to the rear faces of the thicker wall portions.

4,488,775

LIGHT ABSORPTIVE FILM HAVING AN ANTI-REFLECTING PROPERTY

Kimiaki Yamamoto, Tucson, Ariz., assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 11, 1982, Ser. No. 377,174
Claims priority, application Japan, May 26, 1981, 56-79920
Int. Cl.³ G02B 1/10, 5/22
U.S. Cl. 350—164 **11 Claims**



1. A light absorptive film comprising a first sub-film comprising a first dielectric layer and a first metallic layer, a second sub-film comprising a second dielectric layer and a second metallic layer, and a third dielectric layer, said first and second sub-films being arranged oppositely on both the sides of said third dielectric layer and said light absorptive film having the following numerical data:

$n_0 = 1.52$ (glass plate)	
$n_1 = 2.33$	$d_1 = 30$ nm
$n_2 = 1.97\text{–}3.33i$	$d_2 = 10.2$ nm
$n_3 = 1.33$	$d_3 = 300.9$ nm
$n_4 = 1.97\text{–}3.33i$	$d_4 = 10.2$ nm
$n_5 = 2.33$	$d_5 = 30$ nm
$n_6 = 1.52$ (glass plate)	

4,488,776

PLASTIC LENS CELL

James R. Skinner, Saratoga, Calif., assignor to M.U. Engineering & Manufacturing Inc., Mountain View, Calif.

Filed Sep. 30, 1982, Ser. No. 429,041
Int. Cl.³ G02B 7/02
U.S. Cl. 350—242 18 Claims

1. A combination lens cell and lens elements for an optical system comprising:

a plurality of lens elements for transmitting an image;

a pair of identical plastic housing elements having respective body portions and connecting portions, the housing elements designed to cooperatively retain the lens elements between and within the housing elements when their respective connecting portions are joined together, and

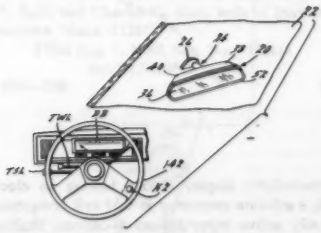
an aperture member having a size capable of being fitted within the housing elements between the lens elements, the aperture member also having a surface configuration to provide spacing by contact with at least two of the lens elements when they are operatively positioned by the housing elements, the aperture member includes an annular flange of such an axial width to extend beyond the connecting portions of the housing elements.

4,488,777

REMOTELY ACTUATED REARVIEW MIRROR FOR AUTOMOTIVE VEHICLES

Frederick T. Bauer, and Jon H. Bechtel, both of Holland, Mich., assignors to Gentex Corporation, Zeeland, Mich.

Filed Sep. 3, 1981, Ser. No. 299,104
Int. Cl.³ G02B 17/00
U.S. Cl. 350—279 18 Claims



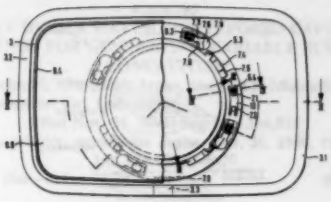
1. A remotely actuated rearview mirror for an automotive vehicle, said mirror comprising, in combination, a reflective element having a full reflectance mode and a partial reflectance mode, eccentric cam means connected to said reflective element, means including unidirectional, rotatable DC motor means operable upon multiple revolutions thereof to drive said cam means and index said reflective element successively between said full reflectance and partial reflectance modes, means including manually actuatable switch means operable to initiate energization of said DC motor means, and additional switch means controlling the energization of said DC motor means, to de-energize said DC motor means when said reflective element is in either of its reflective modes.

4,488,778

EXTERIOR REAR-VIEW AUTOMOBILE MIRROR

Herwig W. Polzer, Philipp-Larenz-Str. 32, Freudenberg D-6982, and Werner Seitz, Pfarrer-Nicolaistr. 2, Collenberg D-6981, both of Fed. Rep. of Germany

Filed Mar. 19, 1982, Ser. No. 359,700
Claims priority, application France, Apr. 18, 1981, 81 07556
Int. Cl.³ G02B 7/18; F16B 7/20
U.S. Cl. 350—631 3 Claims



1. An external rear view automobile mirror comprising:

a shell-shaped mirror housing (3) attachable to the outer side of a car body;

a mirror support (5) pivotally mounted within said housing;

a glass support plate (9) for mounting the mirror glass; and

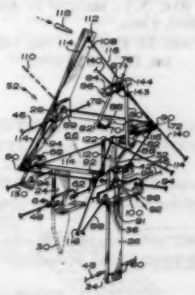
a clamping ring (7) mounted on said mirror support (5) for reciprocal rotation with respect to said mirror support (5) and glass support plate (9) between a first position in which said clamping ring engages fasteners on said glass support plate for locking said glass support plate to said mirror support and a second position in which said clamping ring frees said fasteners and said glass support plate from said mirror support.

4,488,779

LIGHTWEIGHT HELIOSTAT SYSTEM

Kevin Varner, Rte. 2, Ogilvie, Minn. 56358

Filed Nov. 19, 1982, Ser. No. 443,028
Int. Cl.³ G02B 7/18
U.S. Cl. 350—632 10 Claims



1. A lightweight heliostat system usable on a mounting surface to receive radiant energy and reflect the radiant energy to a target comprising:

a rigid stabilizing network attachable to and extending upwardly from the mounting surface;

a tensioning wire framework formed of flexible wire and carried by said rigid stabilizing network;

a rigid mirror connected to and retained by said tensioning wire framework to receive the radiant energy and reflect radiant energy to the target; and

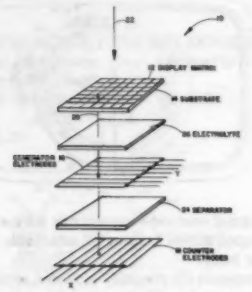
said mirror being planar and defining a compressive strut within said tensioned wire framework.

4,488,780

METHOD OF PRODUCING A COLOR CHANGE IN A CHEMICALLY COUPLED COLOR-CHANGING DISPLAY

Margie M. Nicholson, San Marino, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 327,856, Dec. 7, 1981, Pat. No. 4,456,337.
This application Mar. 2, 1984, Ser. No. 585,669
Int. Cl.³ G02F 1/23
U.S. Cl. 350—320 7 Claims



1. A method of producing a color change in a distinct element of solid, insoluble color-changing material wherein said material is capable of reversibly changing color by reaction with soluble reactants, the method comprising the steps of:

electrochemically generating said reactants at a point spaced apart from said distinct element; and

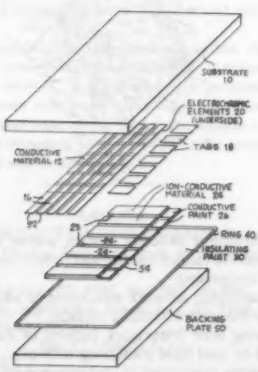
disposing said distinct element to receive said reactants from said point by diffusion through an electrolyte.

4,488,781

METHOD FOR MANUFACTURING AN ELECTROCHROMIC DISPLAY DEVICE AND DEVICE PRODUCED THEREBY

Robert D. Giglia, Rye, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jan. 25, 1982, Ser. No. 342,441
Int. Cl.³ G02F 1/01
U.S. Cl. 350—357 22 Claims



1. A method of producing an electrochromic display device having a pattern of electrochromic elements, comprising the steps of:

depositing electrochromic material in a pattern over a conductive substrate;

applying photoresist material over the electrochromic material and conductive substrate;

exposing and developing the photoresist material to obtain a photoresist pattern wherein photoresist material is left between electrochromic material elements;

applying a solvent-permeable ion-conductive material layer over the photoresist, electrochromic material, and substrate;

applying a layer of solvent-permeable conductive material over the ion-conductive layer; and

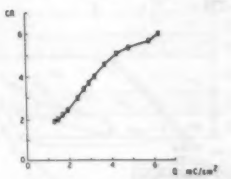
applying photoresist-remover solvent over the layer of solvent-permeable conductive material to remove the photoresist pattern along with the portions of the ion-conductive layer and solvent-permeable conductive material layer overlying said photoresist pattern, thereby to establish isolated regions of ion-conductive material and solvent-permeable conductive material.

4,488,782

ELECTROLYTIC DISPLAY DEVICE EMPLOYING METAL ION CATALYSIS

Donald J. Barclay, Winchester, and Colin L. Bird, Eastleigh, both of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 13, 1982, Ser. No. 377,763
Claims priority, application European Pat. Off., Dec. 24, 1981, 81306153.8
Int. Cl.³ G02F 1/23, 1/17; H01G 9/22
U.S. Cl. 350—357 6 Claims



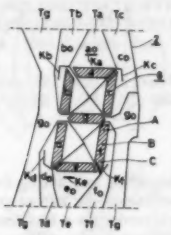
1. An electrolytic display device having an electrolytic display cell, a solution contained in said cell comprising electrochromically active bipyridinium di-cations, thallium ions present in greater molar concentration than the bipyridinium di-cations and which have a reduction potential more negative than the reduction potential of the bipyridinium di-cations, and oxy-anions of phosphorus also present in greater molar concentration than said bipyridinium di-cations, the device further comprising at least one display electrode and a counter electrode, both within said cell, and display writing means for passing an electric current between said counter electrode and said display electrode so as to drive the display electrode to a potential more negative than the reduction potential of the metal ions whereby said metal ions are electrolytically reduced at said electrode, the metal in its reduced state being effective to reduce chemically said bipyridinium di-cations to their electrochromically colored state.

4,488,783

ELECTRODE STRUCTURE FOR ELECTROCHROMATIC DISPLAYS OF THE SEGMENTED TYPE

Yasuo Minami, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 314,422, Oct. 23, 1981,. This application Dec. 22, 1983, Ser. No. 563,888
Claims priority, application Japan, Oct. 30, 1980, 55-153353
Int. Cl.³ G02F 1/17
U.S. Cl. 350—357 3 Claims



1. An electrochromic display device comprising:
two substrates,
display electrodes formed on at least one of said two substrates,
a counter electrode formed on the other of said two substrates,
electrochromic display segmented material selectively formed on said display electrodes,
lead-in electrode means for connecting each of said display electrodes to a corresponding driving circuit for driving said electrochromic display device and coloring said display segments, and
at least one non-conducting segment formed within each of said display electrodes for substantially providing a uniform or constant resistance value between said respective lead-in electrode means and substantially every point of said respective display electrode arranged beneath said corresponding electrochromic display segment material.

4,488,784

CAPACITIVELY COUPLED ELECTROSTATIC DEVICE

Andrew S. Kalt, and Charles G. Kalt, both of Hawthorne Rd., Williamstown, Mass. 01267

Filed Sep. 7, 1982, Ser. No. 415,414
Int. Cl.³ G05D 25/00
U.S. Cl. 350—359 11 Claims

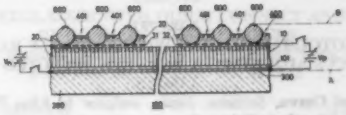
1. An electrostatic device of the kind having a fixed electrode, a variable electrode comprising a sheet of resilient material having at least one electrically conductive surface, a portion of said variable electrode being held at rest adjacent to said fixed electrode and a film of electrically insulative material positioned between said fixed and variable electrodes to maintain electrical isolation therebetween so that an electric field generated between said fixed and variable electrodes causes said variable electrode to bend and to become coadunate with said fixed electrode, a pair of electrical terminals for providing electrical access to said device to which a voltage source may be connected to generate said field and activate said device, one of said terminals being ohmically connected to said fixed electrode, wherein the improvement comprises
for electrically exciting said variable electrode, only a capacitive means for capacitively connecting the other of said terminals to said variable electrode and for rendering said variable electrode electrically floating.

4,488,785

DISPLAY DEVICE HAVING JUXTAPOSED CAPILLARY OPENINGS FOR GENERATING VARIABLE SURFACE CONCAVITIES

Tadao Kohashi, Moriguchi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed Nov. 24, 1981, Ser. No. 324,576
Claims priority, application Japan, Nov. 26, 1980, 55-166940
Int. Cl.³ G02F 1/29
U.S. Cl. 350—360 39 Claims



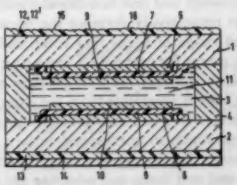
1. A display device having first and second axially spaced apart surfaces, comprising:
a layer of light transmissive liquid lying parallel to and adjacent to said first surface;
means for forming a plurality of openings juxtaposed in a plane parallel to said liquid layer, said openings extending axially from said liquid layer to said second surface and at least partially filled with the liquid, the transverse dimension of each opening being variable as a function of distance from one end of the opening so that capillary action causes the liquid therein to form a variable surface concavity as a function of said distance; and
means for axially moving a portion of said liquid into and out of said openings, under the influence of an electric field, to cause variations in said surface concavity as a function of the intensity of said electric field, whereby light rays axially passing through said openings are modulated in intensity with said electric field.

4,488,786

ELECTRO-OPTICAL DISPLAY ELEMENT FOR PREVENTING SPECULAR REFLECTION OF INCIDENT LIGHT

Rudolf Caramel, Hofheim, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 30, 1981, Ser. No. 258,985
Claims priority, application Fed. Rep. of Germany, May 8, 1980, 3017551
Int. Cl.³ G02F 1/135
U.S. Cl. 350—337 4 Claims



1. A passive electro-optical display element for the represen-

tation of information, having two glass plates spaced apart from each other and forming a chamber therebetween, on the chamber side of each plate there being provided a transparent electrode support and the chamber being filled with a liquid-crystal substance, and wherein polarizers are disposed on the outer surfaces of said plates respectively, the improvement wherein

one of the polarizers on a viewing side of the display element has a front surface facing away from the corresponding glass plate, said front surface being formed with a plurality of depressions of irregular structure for scattering light incident upon said front surface from said viewing side to prevent specular reflection of such light, and wherein

a reflecter is disposed on the other polarizer at the side remote from the viewing side of the display element.

4,488,787

PHOTOGRAPHIC LENS WITH VARIABLE RANGE FOCUS ADJUSTMENT BETWEEN SELECTED END LIMITS

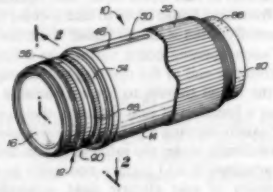
Masami Osawa, Saitama, Japan, assignor to Kino Precision Industries, Ltd., Tokyo, Japan

Filed Nov. 10, 1982, Ser. No. 440,613

Claims priority, application Japan, Apr. 19, 1982, 57-57294[U]

Int. Cl.³ G02B 7/04

U.S. Cl. 350—429 **26 Claims**



1. A photographic lens with variable range focus setting adjustment, comprising:

a generally cylindrical lens housing supporting at least one focusing lens element for axial displacement therein to adjust the focus setting of the photographic lens;

a focus ring rotatable about said lens housing and operably coupled to displace said focusing lens element through a range of focus settings in response to focus ring rotation; and

a range stop assembly for limiting focus ring rotation to a prescribed range of movement relative to said lens housing to correspondingly limit the permitted range of focus setting adjustment, said range stop assembly including a pair of circumferentially spaced end limits formed cooperatively between said lens housing and said focus ring, said end limits respectively defining the opposite ends of the prescribed range of focus ring rotational movement and including means for preventing focus ring rotation beyond said prescribed range, said range stop assembly further including means accessible from the exterior of said focus ring for selectively and individually altering the positions of said end limits to correspond with a selected pair of focus settings thereby altering the circumferential spacing between said end limits and selecting the permitted range of focus setting adjustment between two selected focus settings.

4,488,788

SMALL-SIZE WIDE ANGLE LENS

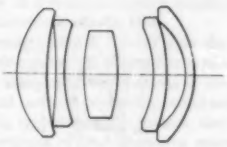
Yoshisato Fujioka, Higashikurume, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 14, 1983, Ser. No. 475,066

Claims priority, application Japan, Mar. 12, 1982, 57-39242

Int. Cl.³ G02B 9/60

U.S. Cl. 350—465 **1 Claim**



1. A small size wide angle lens having five-lenses and comprising, in order from the object, a front group having a convergent action which comprises a first lens in the form of a meniscus positive lens wherein a convex surface is directed towards the object, a second lens in the form of a biconcave negative lens and a third lens in the form of a biconvex positive lens, and a rear group having a divergent action which comprises a fourth lens and a fifth lens, both of which are in the form of a negative meniscus lens wherein a convex surface is directed towards the image, characterized in that the following conditions are met:

$$0.7f < |f4.5| < 1.0f \quad \text{(i)}$$

$$f4 < f5 \quad \text{(ii)}$$

$$1.2 < r7/r9 < 3.5 \quad \text{(iii)}$$

$$0.09f < d6 < 0.15f \quad \text{(iv)}$$

$$29 < \nu 3 < 48 \quad \text{(v)}$$

where f is the resultant focal length of the whole system, f4 and f5 are the focal length of the fourth and fifth lenses, respectively, f4.5 are the resultant focal length of the fourth and fifth lenses, r7 and r9 are the radius of curvature of the spherical surface on the object side of the fourth and fifth lenses, respectively, d6 is the air spacing between the third and fourth lenses, and $\nu 3$ is the Abbe's number of a glass material for the third lens.

4,488,789

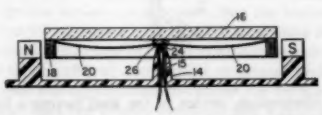
ELECTROMAGNETICALLY DEFLECTABLE DEVICE

George C. Keaney, Ossining, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Dec. 21, 1981, Ser. No. 332,897

Int. Cl.³ G02B 27/17

U.S. Cl. 350—486 **18 Claims**



1. A device including a pivotally mounted member having electrical connections comprising:

a frame;

a member;

a support for mounting said member to said frame, said support having a first attachment end attached to said frame, and a second attachment end;

a resilient element extending between said member and said support, for pivotally mounting said member to said support; and

at least one lead wire extending from said member;

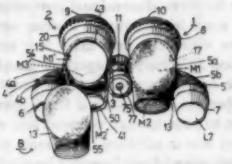
characterized in that said resilient element is a mass of resilient material and said at least one lead wire is embedded in said mass of material and extends from said member to said support through said element.

4,488,790

BINOCULAR AND SPECTACLE-TYPE MOUNTING ASSEMBLY THEREFOR

William J. Beecher, 1960 Lincoln Park West, Chicago, Ill. 60614

Filed Jan. 29, 1982, Ser. No. 344,062
Int. Cl.³ G02B *23/18, 7/02;* G02C *3/00*
U.S. Cl. 350—549 **9 Claims**



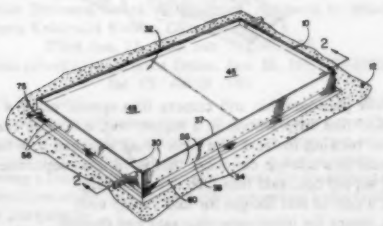
1. In a binocular including a pair of telescopes each having a hollow body shell, a plurality of mirrors in said shell arranged to provide a folded light path therethrough, and eyepiece and objective lenses mounted on said shell at opposite ends of said light path, the improvement wherein said mirrors are ovally-shaped and are sized to conform to the respective cross sections thereat of the light bundle transmitted by said objective lenses, and wherein said shell defines an internal arcuate mirror edge-receiving surface for each of said mirrors, and a portion of the edge of each mirror is adhesively secured to the said receiving surface therefor by an elastic adhesive.

4,488,791

HYDRODYNAMIC SKYLIGHT APPARATUS

Glenn S. Hinchliffe, 984 Van Dyke St., Laguna Beach, Calif. 92651

Filed Mar. 11, 1982, Ser. No. 357,162
Int. Cl.³ E04B *7/18;* G02B *27/00, 5/20*
U.S. Cl. 350—582 **9 Claims**



1. A hydrodynamic skylight apparatus adapted to be mounted in a substantially horizontal plane over an opening in a roof structure, in combination with a reservoir in which water is disposed so as to allow sunlight to shine therethrough and into the associated interior area below said skylight, thereby creating an aesthetic display of sunlight, said combination comprising:

a substantially rectangular frame structure affixed to a roof structure;

at least one light-transmitting-panel member adapted to be supported in said frame structure;

means formed around the peripheral inner surface of said frame structure to support said panel therein;

a reservoir defined by said frame structure and said panel, whereby said water is superposed over said panel to allow sunlight to pass through said water and said light-transmitting panel;

sealing means interposed between said panel and said support means for said panel, in order to prevent fluid from passing therebetween; and

a frame-structure-support means adapted to be mounted between said roof structure and said rectangular frame structure, said frame structure comprising:

a continuous side-support wall having an inlet and an outlet located so as to communicate with said reservoir, in order to allow fluid to enter and exit said reservoir under controlled conditions; and

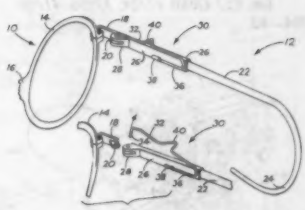
fluid-control means interconnecting said inlet and outlet.

4,488,792

EYEGLASSES WITH QUICK CONNECT AND DISCONNECT TEMPLE PIECES

Otto W. Wagner, 2927 E. Burnside St., Portland, Oreg. 97214

Filed Mar. 30, 1983, Ser. No. 480,472
Int. Cl.³ G02C *5/22*
U.S. Cl. 351—153 **7 Claims**



1. An eyeglass assembly comprising

(a) a front frame piece,

(b) a pair of temple pieces,

(c) mating hinge knuckles on the front frame and temple pieces, and

(d) removable pin means for releasably interconnecting the front frame and temple pieces, each pin means comprising:

(1) an arm,

(2) on one end of the arm pin means dimensioned for insertion into the knuckles when in registering mated position, and

(3) on the other end of the arm, mounting means for mounting the arm on the eyeglass assembly for shifting movement between an advanced position wherein the pin means is inserted in the mated knuckles, thereby securing the temple piece to the front frame piece, and a retracted position wherein the pin means is removed from the knuckles, thereby detaching the temple piece from the front frame piece.

4,488,793

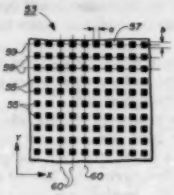
PHOTODEPOSITING A CRT SCREEN STRUCTURE USING DISCRETE-ELEMENT OPTICAL FILTER

George M. Ehemann, Jr., Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 23, 1982, Ser. No. 452,797
Int. Cl.³ G03B *41/00*
U.S. Cl. 354—1 **6 Claims**

1. In a method for photodepositing a screen structure for a CRT including projecting a light field (a) through a light-trans-

mission IC filter, said filter having tailored variations of light transmission for producing predetermined variations in light intensity in said light field, (b) through a photographic master and (c) incident upon a photosensitive layer,



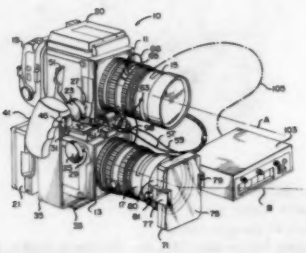
the improvement wherein said filter comprises an array of discrete, spaced-apart, opaque elements of predetermined sizes no less than about 1.5 mils in their smallest dimensions arranged along parallel uniformly spaced-apart lines that are no more than about 15 mils apart.

4,488,794

PHOTOGRAPHIC APPARATUS FOR MAKING SIMULTANEOUS EXPOSURES

Joanne Dolgow, 407 Pershing Dr., Silver Spring, Md. 20910, and David Riddle, Northridge, Calif., assignors to Joanne Dolgow, Silver Spring, Md.

Filed Jun. 28, 1982, Ser. No. 392,686
Int. Cl.³ G03B *17/24, 17/50, 41/00*
U.S. Cl. 354—83 **23 Claims**



1. Photographic apparatus for providing first and second contemporaneous, individual records of a common image, said apparatus comprising:

first selectively actuable visual image recording means for recording a first visual image of objects within a field of view, said first visual image recording means including a first housing having a first opening defined therein and a first optical axis extending through said first opening and into said field of view;

second selectively actuable visual image recording means for recording a second visual image of objects within said field of view, said second visual image recording means including a second housing having a second opening defined therein, a second optical axis extending through said second opening and into said field of view, and positive image film pack means disposed along said second optical axis to receive and automatically form a photographic print of the recorded visual image in the field of view of said second recording means;

mounting means for securing said first and second housings together such that said first and second optical axes extend in parallel spaced relation in the same direction;

actuator synchronization means for synchronizing said first and second image recording means for simultaneous actuation; and

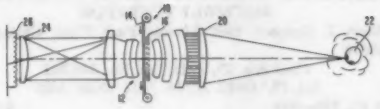
parallax correction means removably securable to said second housing along said second optical axis.

4,488,795

CAMERA FOR THREE-DIMENSIONAL PORTRAITURE

Douglas F. Winnek, 80 Laurel Dr., Carmel Valley, Calif. 93924

Filed Sep. 13, 1982, Ser. No. 417,816
Int. Cl.³ G03B *35/08*
U.S. Cl. 354—115 **11 Claims**



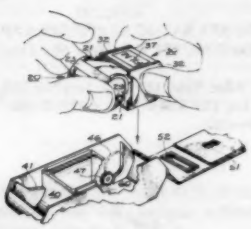
1. A camera for three-dimensional portraiture comprising: a multi-element main lens having a shutter between a pair of elements of the main lens, said main lens being adapted for normal operation at infinity; an aperture member between the shutter and the next adjacent element of said main lens, said aperture member provided with a fixed aperture therein to allow light rays to pass through the main lens when the shutter is opened; a first lens in advance of the main lens, the first lens having a predetermined focal length; a lenticular screen on the opposite side of the main lens, the lenticular screen having a plurality of lenticules on the front face thereof, there being a film plane adjacent to the rear surface of the lenticular screen at which a photographic film can be placed; and a field lens between the main lens and the lenticular screen to normalize the light rays from the main lens.

4,488,796

PHOTOGRAPHIC STILL CAMERA FILM SYSTEM

Evan A. Edwards, 2 Prospect Hill Rd., Pittsford, N.Y. 14534

Filed Apr. 25, 1983, Ser. No. 488,270
Int. Cl.³ G03B *17/26*
U.S. Cl. 354—275 **20 Claims**



1. A photographic still camera film system using a paper backed film strip wound in a supply coil, a leading end of a paper backing for said film strip being attached to a take-up spindle in a take-up container that is variably separable from said supply coil, said film system comprising:

a. a pair of end flanges for said supply coil;

b. means for interconnecting said end flanges;

c. resilient material covering inner faces of said end flanges and engaging ends of said supply coil;

d. said engagement of said resilient material with said ends of said supply coil being arranged for keeping convolutions of said supply coil light tight;

e. a rotatable hub supported on said flanges for engaging the inside of said supply coil to allow said supply coil to rotate relative to said flanges as said supply coil is unwound;

f. said resilient material having a frictional engagement with said ends of said supply coil effectively preventing clock

springing of said supply coil as said supply coil is unwound; and

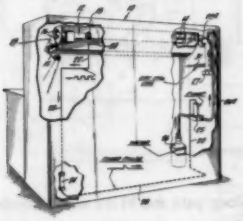
g. a gear arranged on said take-up container for turning said take-up spindle to advance said paper backed film strip from said supply coil to said take-up container.

4,488,797

APPARATUS FOR CONTROLLING THE FLOW OF WATER TO A DIAZO PRINTER

Roger S. Funk, Holicong, Pa., assignor to R. Funk & Co. Inc., Doylestown, Pa.

Filed May 6, 1982, Ser. No. 375,654
Int. Cl.³ G03B 7/00
U.S. Cl. 354—298 **9 Claims**



1. Apparatus for use with a diazo printer of the type comprising a developer chamber, an evaporator, a pulse-responsive water pump for supplying water to said evaporator and a motor for moving copy paper through said developer chamber, said apparatus serving to control the actuation of said pump to supply water to said evaporator at a rate related to the speed of said motor and comprising:

transducer means responsive to operation of said motor for producing a train of electrical pulses having a repetition rate proportional to said motor speed;

digital electronic divider means responsive to said train of pulses for producing output pulses at a rate which is equal to said repetition rate of said train of pulses divided by an integral divisor having a value D,

said divider means comprising manually-settable switch means for enabling manual setting of the said value of said divisor D; and

means for supplying said output pulses to said pulse-responsive pump to actuate it once for each output pulse supplied to it.

4,488,798

AUTOMATIC FOCUSING DEVICE

Takashi Iida, Sakai; Masayuki Ueyama, Toyonaka, and Toshihiko Ishimura, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

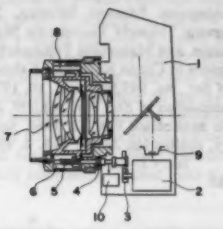
Filed Jun. 13, 1983, Ser. No. 503,564
Claims priority, application Japan, Jun. 21, 1982, 57-107340
Int. Cl.³ G03B 7/08
U.S. Cl. 354—402 **7 Claims**

1. An automatic focusing device of a camera for use with an exchangeable zoom lens which includes an objective adjustable for both focusing and zooming and a signal means for generating a focal length signal representing the focal length of said objective set by the zooming, said automatic focus control device comprising:

(a) a focus detection means for detecting an image of an object through said objective to generate a focus detection signal ΔL representing the amount of and the direction of the defocusing of said image relative to a predetermined film plane;

(b) a motor driven for focus adjustment of said objective;

(c) an operation circuit means for determining the amount of and the direction of the driving of said motor in accordance with said focus detection signal from said focus detection means and said focal length signal from said signal means of said exchangeable zoom lens such that correction by the set focal length is made to the focus adjustment of said objective; and



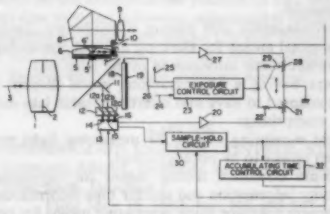
(d) a motor driving circuit for driving said motor under the control of said operation circuit means.

4,488,799

METERING SYSTEM USING A FOCUS DETECTING OPTICAL SYSTEM

Takashi Suzuki, Yokohama, and Kazuya Hosoe, Kunitachi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 367,733, Apr. 12, 1982, abandoned. This application Sep. 1, 1983, Ser. No. 528,240
Claims priority, application Japan, Apr. 14, 1981, 56-55763
Int. Cl.³ G03B 7/08
U.S. Cl. 354—406 **22 Claims**



1. In a device having a focus detecting system and an exposure measuring system, said focus detecting system comprising:

(a) an optical system for focus detection;

(b) first photoelectric means for the focus detection, said first photoelectric means being arranged to receive light from an object through said optical system and to produce an output signal in response to the received light; and

(c) first circuit means for the focus detection, said first circuit means being arranged to receive the output signal of said first photoelectric means and to provide a focus related output signal on the basis of the received signal;

an exposure measuring system including

(A) second photoelectric means for exposure measurement, said second photoelectric means being arranged to receive the light from the object through said optical system for the focus detection and to produce an output signal in response to the received light; and

(B) second circuit means for exposure measurement, said second circuit means being arranged to receive the output signal of said second photoelectric means and to provide an exposure related output signal on the basis of the received signal,

wherein said optical system includes light dividing optical means for distributing the light to said first and second photoelectric means and having two different types of area type beam splitting surfaces each area type beam splitting surface having a pattern with a plurality of light transmitting parts and a plurality of light reflecting parts, said second photoelectric means being arranged together with said first photoelectric means to receive the light divided by said optical means, said first photoelectric means having a plurality of photoelectric elements arranged to receive the light divided by respective area type beam splitting surfaces.

4,488,800

PHOTOGRAPHING MODE DISPLAY DEVICE OF A CAMERA

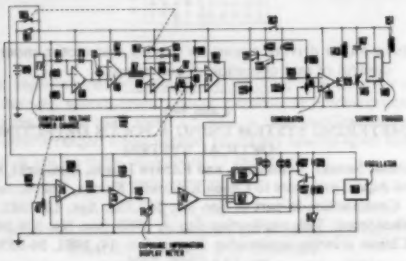
Yukio Iura, Kanagawa; Masami Shimizu, Tokyo; Hiroshi Aizawa, Kanagawa; Tokuichi Tsunekawa; Masanori Uchidoi, both of Yokohama, and Masayoshi Yamamichi, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 949,560, Oct. 10, 1978, abandoned, which is a continuation of Ser. No. 763,099, Jan. 27, 1977, abandoned. This application Feb. 13, 1980, Ser. No. 121,104

Claims priority, application Japan, Feb. 4, 1976, 51-11001

Int. Cl.³ G03B 7/085

U.S. Cl. 354—445 **36 Claims**



1. A photographic camera having a photographing mode display device and an interchangeable lens, having the following arrangement:

(a) an interchangeable lens having a diaphragm device and having a signal means for showing a signal containing fully open aperture value information of the lens; and

(b) a camera having a photographing mode display device which is adapted to have said interchangeable lens mounted thereon, comprising:

(1) a light measuring circuit for measuring light received from an object to be photographed;

(2) exposure condition setting means for supplying film sensitivity information and shutter time information;

(3) diaphragm aperture value computing means for computing information concerning the number of steps by which said interchangeable lens mounted on the camera should be stopped down from the fully open aperture position thereof based on the exposure condition setting information from the exposure condition setting means;

(4) diaphragm control means for controlling the operation of the diaphragm device corresponding to the computed value output of the diaphragm aperture value computing means;

(5) reference signal producing means which produces a reference signal;

(6) comparison means which compares the output of said diaphragm aperture value computing means with said reference signal and produces an electrical signal by determining whether or not the signal from said computing means is less than zero; and

(7) warning means for giving a warning relative to photographic information, said warning means being connected to said comparison means to display by illumination said warning when a photographic condition based on the output signal of said comparison means falls outside an associated range of the camera in response to a photo taking action of the camera.

4,488,801

MAXIMUM THROUGHPUT DUPLEXING SYSTEM FOR XEROGRAPHIC MACHINES

David K. Gibson, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

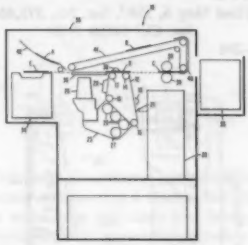
Filed Jan. 3, 1983, Ser. No. 455,368

Int. Cl.³ G03G 15/00

U.S. Cl. 355—3 SH **6 Claims**

1. In a xerographic device having a station for transferring an image to copy sheets sequentially fed from an input supply source and a closed-loop copy sheet paper path for returning copy sheets to said image transferring station with the opposite side presented for imaging, and wherein said device is operable to perform regularly spaced image transfer cycles at said station, the process comprising the steps of:

feeding M out of N copy sheets sequentially from said source past said image transferring station and into said closed-loop path where N is a whole number corresponding to the maximum number of said copy sheets containable in



said closed-loop path and M is a whole number equal to or less than N;

transferring a first sequence of M images to a first side of respective said copy sheets during said feeding step;

sequentially reintroducing said M out of N copy sheets to said image transferring station from said closed-loop path with the first said reintroduced sheet arriving at said transfer station concurrent with the commencement of the N+1 image transfer cycle; and

transferring a second sequence of M images to the opposite side of respective said copy sheets during said reintroducing step.

4,488,802

ELECTROPHOTOGRAPHIC DEVICE WITH SINGLE STATIONS SERVING MULTIPLE FUNCTIONS

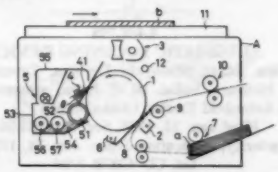
Ryuzo Sunaga, and Seiji Joh, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 14, 1983, Ser. No. 458,078

Claims priority, application Japan, Jan. 14, 1982, 57-3292

Int. Cl.³ G03G 15/08

U.S. Cl. 355—3 CH **7 Claims**



1. An electrophotographing device for copying from an original onto a transfer sheet by charging, exposing, developing, transferring and cleaning, said device comprising:

a photo-sensitive member arranged to revolve past operating stations during a copying operation,

a developing and cleaning unit means located at one operating station for applying toner to said photo-sensitive member and for cleaning said photo-sensitive member during alternate revolutions of said photo-sensitive member, respectively, said developing and cleaning unit means having a wiper blade positioned therein to provide the cleaning operation of said copying operation, and

a charging and transferring unit means located at another operating station for alternately carrying out the charging and transferring operations of said copying operation during alternate revolutions of said photo-sensitive mem-

ber past said charging and transferring unit means, whereby said copying operation requires two revolutions of said photo-sensitive member.

4,488,803

SLIT EXPOSURE TYPE COPYING CAMERA

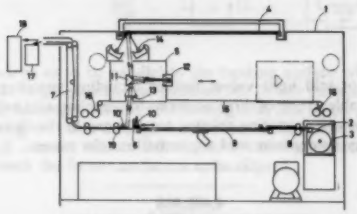
Takamichi Nishihama, and Masahiko Otsuji, both of Hikone, Japan, assignors to Dainippon Screen Manifacturing Co., Ltd., Kyoto, Japan

Filed Feb. 2, 1983, Ser. No. 463,184

Claims priority, application Japan, May 12, 1982, 57-69012[U]

Int. Cl.³ G03B 29/00

U.S. Cl. 355—28 **6 Claims**



1. In a slit exposure type copying camera comprising a glass sheet for mounting an original thereon, said glass sheet located on the upper surface of a camera box housing, a suction generating surface adapted for holding a predetermined length of unrolled photosensitive material by suction in a plane parallel to said original mounting glass sheet in the lower region of the interior of said camera box, a slit exposure type scanner adapted for being reciprocably moved in a region between said glass sheet and said suction generating surface, transfer means for transfering said predetermined length of photosensitive material onto and from said suction generating surface, cutter means disposed adjacent an exposure start position for cutting said predetermined length of photosensitive material exposed to light by means of said scanner, and conveying means for conveying the exposed cut length outside of the camera, the improvement wherein: said suction generating surface is a stationary suction plate capable only of selectively holding photosensitive material transferred thereon; and said transfer means for transfering said predetermined length of photosensitive material to and from said stationary suction plate comprising drive means positioned between said cutter means and said conveying means, said drive means being adapted for advancing a length of photosensitive material to said conveying means after exposure thereof, and for simultaneously pulling another length to be exposed onto said stationary suction plate from its unwinding station wherein it is stored in rolled form; and a movable suction member adapted for lifting the cut end of said length from said suction plate and transfering it into engagement with said drive means.

4,488,804

METHOD AND MACHINE FOR AUTOMATIC FOCUSING IN A PROJECTION SYSTEM WITH CONTINUOUSLY VARIABLE MAGNIFICATION

Tsuneo Takagi, Kurita, Japan, assignor to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

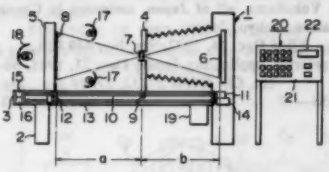
Continuation of Ser. No. 230,396, Feb. 2, 1981, abandoned. This application Dec. 30, 1982, Ser. No. 454,583

Claims priority, application Japan, Feb. 25, 1980, 55-21590

Int. Cl.³ G03B 27/34, 27/40

U.S. Cl. 355—56 **17 Claims**

1. A method for automatic focusing in a projection system with continuously variable magnification, wherein an original picture is projected onto a photosensitive material by a focusing lens, and wherein one of these three members, the original picture, the focusing lens and the photosensitive material, is fixed and the other two, first and second members, are adapted to be moved in a direction of a light axis, the improvement wherein, said system operates in a first magnification range and second magnification range and when the required magnification of a picture image is changed in the first range, said first member, having a larger distance to move than that of said second member, commences movement before said second member commences movement, and said second member is moved to goal positions dependent on the instantaneous position of said first member, said second member following substantially instantly to said goal positions including the position of said required magnification, the projected picture image being substantially constantly focused onto the photosensitive



material, and when the required magnification of a picture image is changed in the second range, said second member, having a larger distance to move than that of said first member, commences movement before said first member commences movement, and said first member is moved to goal positions dependent on the instantaneous position of said second member, said first member following substantially instantly to said goal positions including the position of said required magnification, the projected picture image being substantially constantly focused onto the photosensitive material.

4,488,805

REPRODUCTION CAMERA CONTROL SYSTEM

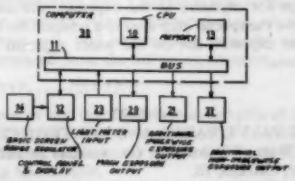
Steen Andersen, Allerod, Denmark, assignor to Oce-Helioprint AS, Kvistgaard, Denmark

Filed May 18, 1983, Ser. No. 495,597

Claims priority, application Netherlands, May 26, 1982, 8202142; Nov. 12, 1982, 8204380

Int. Cl.³ G03B 27/72

U.S. Cl. 355—69 **7 Claims**



1. In a reproduction camera for the production of contact screen prints from an original, including means for holding a contact screen and a light-sensitive material, means for exposing to light an original to be reproduced, an optical system for projecting a light image of the original onto the plane of the light-sensitive material, and means for controlling the light dosage of each exposure,

a control system comprising computer means, computer output means and means for inputting to the computer means data representing the minimum and maximum optical densities of the original to be reproduced, optical characteristics of the screen being used and operating characteristics of said optical system, of said exposing means of the light-sensitive material,

said computer means being responsive to such inputted data to determine for each said original, and being operative via said output means and said exposure controlling means to cause said exposing means to apply, a light dosage for

an imagewise main exposure of said material through said screen and a light dosage or dosages for at least one of an imagewise additional exposure of said material without a screen and a non-imagewise additional exposure thereof through said screen so that a screened print is produced of which the highlight dots and the shadow dots have specific sizes corresponding substantially completely to the minimum and maximum optical densities of the original.

4,488,806

SHOT ARRANGING METHOD IN A DIVISIONAL PRINTING APPARATUS

Kazuo Takahashi; Hiroshi Sato, both of Tokyo, and Masao Kosugi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 14, 1982, Ser. No. 449,825
Claims priority, application Japan, Dec. 21, 1981, 56-207679
Int. Cl.³ G03B *27/32, 27/44*
U.S. Cl. 355—77 **3 Claims**

1. A divisional printing method for divisionally printing a pattern from a mask onto a wafer by a plurality of exposure shots each at one of a plurality of exposure sites on the wafer except at sites where a special chip area is to be avoided, said method comprising the steps of:

causing relative movement between the mask and the wafer for successive printing by moving along orthogonal axes from a position for exposure at one exposure site on the wafer to a position for exposure at a next exposure site on the wafer, except about sites on the wafer where the special chip area is to be avoided; and

causing relative movement between the mask and the wafer for printing about at least a portion of the special chip area by moving obliquely with respect to said axes from a position for exposure at one exposure site on the wafer adjacent the special chip area to a position for exposure at another exposure site on the wafer adjacent the special chip area.

4,488,807

LIGHT VALVE/FADER AND CONTROL CIRCUIT

Charles J. Watson, Dunwoody, Ga., assignor to Bell & Howell Company, Chicago, Ill.

Filed Jul. 23, 1982, Ser. No. 401,199
Int. Cl.³ G03B *21/36, 27/78*
U.S. Cl. 355—83 **6 Claims**

1. A photographic light control device comprising:

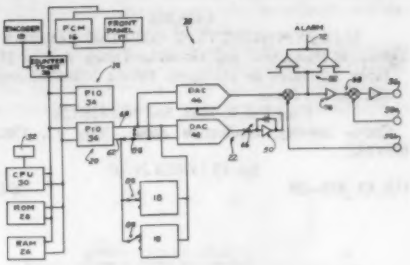
a set of three identical valves, each including a pair of control vanes;

electronic means for reading light control information from a permanent storage medium and storing light control signals relating to each of the three primary colors;

electronic means for storing a command sequence for converting quasi-binary color signals received by said device into true binary color signals;

means for initiating the execution of said light control signals stored in said electronic storing means by said light valves, said initiating means including means for sequentially addressing and transferring light correction data to each of said light valves;

digital to analog conversion means for converting said true binary coded signals to analog position control signals for positioning said light valve vanes in accordance with said light control signals; and



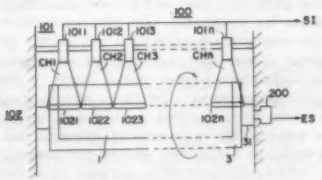
each of said light valves further including switch means settable to one of three positions for enabling said valve to receive information relating to only one of the three primary colors from said sequential transfer means.

4,488,808

PRINT INSPECTING DEVICE

Yasuo Kato, Tokyo, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 221,802, Dec. 31, 1980, abandoned.
This application Nov. 2, 1983, Ser. No. 548,025
Claims priority, application Japan, Jan. 9, 1980, 55-1051
Int. Cl.³ G01N *21/88*
U.S. Cl. 356—73 **8 Claims**



1. A print inspecting device in which the surface of a print moving in one direction is optically scanned by light emitting and receiving means on a detecting head to obtain image data from a picture pattern on said print surface and said image data thus obtained is utilized to inspect whether or not said print is satisfactory, which comprises:

light emitting and receiving means forming a plurality of channels in which elongated light spots having a length perpendicular to the direction of movement of said print which is longer than a width thereof which is in the direction of movement of said print are provided adjacent to each other in a straight line such that a longitudinal direction of each light spot coincides with the direction of width of said print.

4,488,809

PLANIZING TARGET

John M. Miller, Huntington Station, and Richard O. Barton, Levittown, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

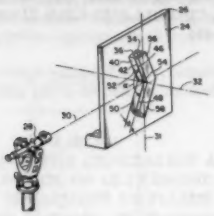
Filed Apr. 19, 1982, Ser. No. 369,800
Int. Cl.³ G01C *15/06*
U.S. Cl. 356—138 **7 Claims**

1. A unitary alignment target comprising:

a planar banking surface which is held against a planar surface of an industrial fixture;

a non-planar surface extending from the banking surface; and

a continuous target pattern marked on the non-planar surface so as to be parallel to the banking surface whereby said target pattern also parallels the fixture surface when the banking surface is held thereagainst, said target pattern being viewable through a telescope having a line of sight and a cross hair which define a reference plane with which the fixture surface is to be aligned.



4,488,810

CHEMICAL ANALYZER

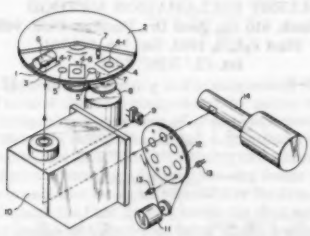
Isamu Hatanaka, Kanagawa; Takashi Sekine, and Kenichiro Yazawa, both of Saitama, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 1, 1980, Ser. No. 212,009

Claims priority, application Japan, Nov. 30, 1979, 54-154313

Int. Cl.³ G01N *21/00*

U.S. Cl. 356—244 **7 Claims**



1. A chemical analyzer comprising: a conveying mechanism for conveying along a chemical analysis path a chemical analysis slide including at least one layer impregnated with a material including a component to be measured; driving means for driving said conveying mechanism; temperature controlling means for maintaining said chemical analysis slide at a constant temperature; means for measuring the reflection optical density of said chemical analysis slide; and means for determining the concentration of said predetermined component of said material to be measured in accordance with the reflection optical density thus measured, said constant temperature mechanism comprising at least one stationary temperature control plate in one part of which a temperature changing element is provided to thereby form a discrete heating area, said conveying mechanism being slidably provided on said stationary temperature control plate, said temperature control plate having (a) at least one opening outside the discrete heating area through which an irradiating light beam from a light source of said photometric mechanism and a reflection light beam from said chemical analysis slide pass, and (b) at least one reference reflection plate at a position which is irradiated by said irradiating light beam, said discrete heating area being formed such that said conveying mechanism has at least one chemical analysis slide holding section outside said discrete heating area for loading said chemical analysis slide, whereby an incubation time can be defined by both the rotation speed of the conveying mechanism and the form of the heating area such that chemical analyzer is capable of incubating said chemical analysis slide and measuring the reflection optical density of said incubated chemical analysis slide during one or less rotation of said conveying means.

4,488,811

BASE-LINE CORRECTION MEANS FOR SPECTROPHOTOMETER SYSTEM

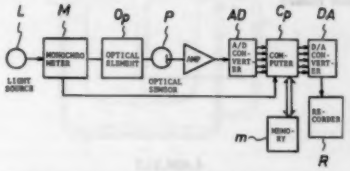
Toshiaki Fukuma, Kyoto, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

Filed Mar. 19, 1982, Ser. No. 359,902

Claims priority, application Japan, Jun. 30, 1981, 56-102813

Int. Cl.³ G01J *3/42*

U.S. Cl. 356—319 **2 Claims**



1. A spectrophotometer system comprising:

light source means for generating a beam of light;

sample cell means containing a sample to be analyzed;

monochrometer means for scanning said sample cell means with discrete wavelengths of light from said beam;

optical sensor means for measuring intensity signals Tn and Tn+1 of first and second discrete wavelengths of light emitted from said sample cell means;

computing means responsive to the intensity signals Tn and Tn+1 of said first and second wavelengths measured by said optical sensor means for performing base-line corrections thereon, and on intensity signals Tk of light having wavelengths intermediate to said first and second wavelengths, said base-line corrections being computed from the relationship between intensity signals Tn and Tn+1, which are measured with a sample in said sample cell, and reference intensity signals measured with no sample in said sample cell, said intermediate intensity signals Tk being computed from the following equation,

$$T_k = k/2^N(T_{n+1} - T_n) + T_n$$

, where k is one of said intermediate wavelengths of light, n is said first wavelength and n+1 is said second wavelength; and

means for storing said intensity signals Tn, Tn+1 and Tk for analyzing said sample.

4,488,812

PHOTOMETRIC APPARATUS

Thomas L. Kraft; Howard A. Vick, and James W. Meador, all of Houston, Tex., assignors to American Home Products Corporation, New York, N.Y.

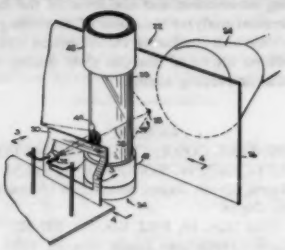
Division of Ser. No. 041,475, May 22, 1979, Pat. No. 4,291,983. This application May 29, 1981, Ser. No. 268,205

Int. Cl.³ G01N *21/00*; G01J *1/42*

U.S. Cl. 356—338 **6 Claims**

1. Photometric apparatus comprising a source of light for projecting light towards a sample to be analyzed, photoelectric means positioned to receive light projected by the source emerging from the sample and having electrical characteristics dependent upon the light received by the photoelectric means, DC power source means for providing DC power at an output thereof to the photoelectric means, indicator means coupled to the photoelectric means, first adjustment means coupled be-

tween the photoelectric means and the DC power source means for adjusting the DC power provided to the photoelectric means, and second adjustment means including rectifier



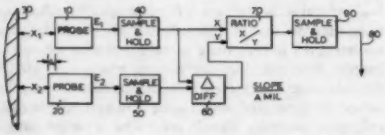
means coupled between a source of AC power and the indicator means for providing DC power at an adjustable level to the indicator means.

4,488,813

REFLECTIVITY COMPENSATING SYSTEM FOR FIBER OPTIC SENSOR EMPLOYING DUAL PROBES AT A FIXED GAP DIFFERENTIAL

Curtis Kissinger, Gloversville, and Richard Dorman, Troy, both of N.Y., assignors to Mechanical Technology Incorporated, Latham, N.Y.

Filed Apr. 29, 1982, Ser. No. 373,112
Int. Cl.³ G01B 11/14
U.S. Cl. 356—375 **4 Claims**



1. An optical system for determining the position of a target, said system comprising:

a first fiber optic proximity probe at a variable distance X_1 from the target and capable of generating an output E_1 corresponding to the amount of light reflected by the target to the probe over distance X_1;

a second fiber optic proximity probe at a variable distance X_2 from the target and capable of generating an output E_2 corresponding to the amount of light reflected by the target to the probe over distance X_2;

said probes are disposed at different distances from the target in such a manner that the difference between said distances is predetermined; and

means for determining X_1 in accordance with the following equation:

$$X_1 = A \times \frac{E_1}{E_2 - E_1}$$

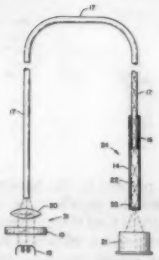
wherein X_1 is the distance from the first probe to the target, A is the difference in the distance of the two probes from the target, and E_1 and E_2 are both in the linear range of the common response curve for the light reflected by the target to the probes.

4,488,814

APPARATUS FOR AND METHOD OF OPTICAL ABSORBANCE AND FLUORESCENT RADIATION MEASUREMENT

Leighton C. Johnson, Edwardsburg, Mich., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Sep. 28, 1981, Ser. No. 306,206
Int. Cl.³ G01J 3/50; G01N 21/64, 21/03
U.S. Cl. 356—414 **36 Claims**



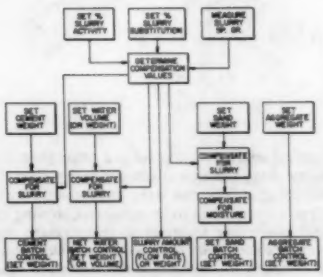
21. In combination, a cylindrical pipette tube or the like having an open end, a piston movable axially within said tube between a first position at said open end and a retracted position space from said open end for aspiration of liquid into said tube and dispensing of liquid from said tube through said open end, and radiation source means incorporated with said piston for directing radiation from said piston generally axially within said pipette tube and through substantially all of the liquid contained therein.

4,488,815

SLURRY RECLAMATION METHOD

Melvin L. Black, 610 Big Bend Dr., Pacifica, Calif. 94044

Filed Feb. 4, 1983, Ser. No. 463,741
Int. Cl.³ B28C 7/04
U.S. Cl. 366—8 **11 Claims**


SET % SLURRY ACTIVITY
SET % SLURRY SUBSTITUTION
MEASURE SLURRY SP. GR.
DETERMINE COMPENSATION VALUES
SET CEMENT WEIGHT
SET WATER VOLUME (OR WEIGHT)
SET SAND WEIGHT
SET AGGREGATE WEIGHT
COMPENSATE FOR SLURRY
COMPENSATE FOR SLURRY
COMPENSATE FOR SLURRY
COMPENSATE FOR MOISTURE
CEMENT BATCH CONTROL (SET WEIGHT)
SET WATER BATCH CONTROL (SET WEIGHT OR VOLUME)
SLURRY AMOUNT CONTROL (FLOW RATE OR WEIGHT)
SET SAND BATCH CONTROL (SET WEIGHT)
AGGREGATE BATCH CONTROL (SET WEIGHT)

1. A method for adjusting the design mix of concrete by substituting a slurry, formed by mixing returned concrete and water, for design values of water cement and sand while maintaining substantially constant the yield and water/cement ratio of the concrete, said method comprising the steps of:

(a) determining the specific gravity of said slurry;

(b) establishing the percentage of slurry to be substituted for fresh concrete mix;

(c) computing the amount of water, sand and active cement in said slurry from the relative amounts of active and passive solids in said slurry and the specific gravity of said slurry, said step of computing including a step of calculating the total slurry amount by subtracting the amount of moisture in the sand design value from the total water

design value, and dividing this result by a value obtained by the steps of (a) multiplying the fractional portion of the slurry representing liquids by the slurry substitution percentage; (b) multiplying the percentage moisture in the sand by the fractional portion representing non-active slurry solids and by the fractional portion representing all solids in the slurry; and (c) subtracting the result obtained in step (b) from the result obtained in step (a) and adding the fractional portion representing all liquids in the slurry; and

(d) reducing the design values of water, cement and sand by the corresponding slurry amounts computed in step (c).

4,488,816

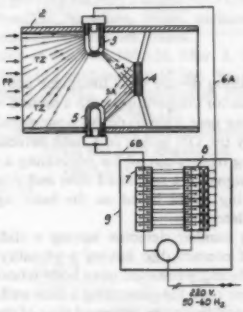
APPARATUS FOR THE GENERATION AND THE AUTOMATIC CONTROL OF ULTRASONIC WAVES IN THE TREATMENT OF FLUIDS

Mario F. Vota, Viale Lombardia, 188, Brugherio (Province of Milano), Italy

Filed Dec. 27, 1982, Ser. No. 453,187

Int. Cl.³ B01F *11/02*

U.S. Cl. 366—116 **3 Claims**



1. An apparatus for treating and homogenizing fluids constituted of several chemical components, by means of ultrasonic waves, comprising a generator of ultrasonic waves, a duct for passing therein a fluid to be treated, a transducer in said duct connected to said generator for emitting said ultrasonic waves in said duct and treating said fluid flowing inside said duct, a receiver in said duct facing said transducer for detecting waves passed through the fluid flowing inside the duct and emitting a detection signal, said generator being of the type generating a unique ultrasonic signal for treating the fluid and controlling the frequency of said ultrasonic signal according to the viscosity and/or the flow rate of the fluid to be treated, said transducer having a single bulb body protruding within said duct and having two openings for emitting two separate beams of said ultrasonic waves generated by said generator, said duct defining a first treatment zone where a first beam of ultrasonic waves performs a treating and homogenizing action on the fluid flowing inside the duct and a second zone, downstream said first zone, where a second beam is received from said receiver for controlling the homogeneity of the treated fluid.

4,488,817

DEVICE FOR MAKING FROZEN CONFECTIONS

Susumu Uesaka, Funabashi; Toshio Hagiwara, Tokyo; Akira Yusen, Soka; Minoru Takayama, Ichikawa, and Shinichi Urakami, Matsudo, all of Japan, assignors to Nippon Light Metal Co., Ltd., Japan

Filed Jul. 7, 1983, Ser. No. 511,469

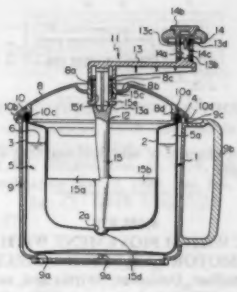
Int. Cl.³ B01F *15/06*

U.S. Cl. 366—149 **8 Claims**

1. Device for making frozen confections such as ice cream comprising:

a double-walled cylindrical vessel having an upper end and a closed bottom, said vessel comprising an inner vessel member and an outer vessel member, a space is formed between said inner vessel member and said outer vessel member which is hermetically sealed and filled with a cold keeping agent;

a ring having an inner periphery and an outer periphery, the inner periphery is provided with an annular groove and an inner supporting shoulder, and the outer periphery is provided with an annular supporting shoulder, the upper end of said double-walled vessel being embracingly fitted in said groove of said ring;



an outer receptacle having an upper open end forming an upper edge and a closed bottom;

said double-walled cylindrical vessel being located within said outer receptacle, wherein said supporting shoulder of said ring is engaged with the upper edge of said outer receptacle so as to be supported thereby;

a cover member having a periphery adapted to engage at its periphery the inner supporting shoulder of the inner periphery of said ring, said cover member is also provided with a bearing hole, and a stirring means journaled in the bearing hole of said cover member and provided with agitating blades positioned in said double-walled vessel.

4,488,818

WATCH WITH AN ANALOG DISPLAY DEVICE THE DIAL OF WHICH IS FORMED BY A LIQUID CRYSTAL DISPLAY CELL

Eric Saurer, Bevaix; Fereydoun Gharadjedaghi, Neuchatel, and Yves Ruedin, St-Blaise, all of Switzerland, assignors to Asulab S.A., Bienne, Switzerland

Filed Sep. 29, 1982, Ser. No. 426,384

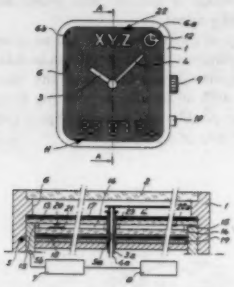
Claims priority, application Switzerland, Oct. 28, 1981, 6876/81

Int. Cl.³ G04B *19/04, 19/06*

U.S. Cl. 368—71 **11 Claims**

1. In a watch comprising time display hands adapted to be mechanically driven; and a digital display cell positioned behind said hands to form a dial for said hands, said digital display cell including a composite layer comprising at least one layer of liquid crystal and having display zones which respond to an electrical field provided in response to an external action by a modification of their opacity; a fluid-tight enclosure comprising a front plate, a rear plate and spacing and closing means which define a closed space containing the layer of liquid crystal; and light-reflecting and diffusing means disposed behind said composite layer; the improvement wherein said cell is of the type in which said composite layer is transparent

under the effect of said field and opaque in the absence of the field, with the result that said layer has a uniformly opaque



appearance in the absence of said field and thus forms itself the dial for said hands.

4,488,819

ELECTRONIC WATCH MOVEMENT WITH MODULAR STEPPER MOTOR AND SETTING MECHANISM

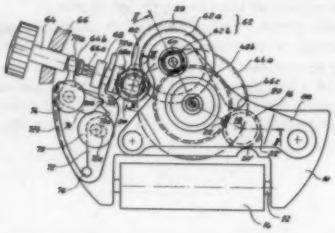
Jean-Claude Schaffner, Delémont, Switzerland, assignor to ETA S.A., Fabriques d'Ebauches, Granges, Switzerland

Filed Apr. 18, 1984, Ser. No. 601,454

Claims priority, application Switzerland, May 5, 1983, 2450/83

Int. Cl.³ G04B *19/02, 29/00*

U.S. Cl. 368—220 **2 Claims**



1. An electronic watch movement, comprising:

a motor including a coil, a stator and a rotor, said rotor being mounted to pivot in said stator;

spindles for the hands of a watch, said spindles also being mounted to pivot in said stator;

gear means for assuring kinematic connection between said rotor and said spindles for the hands, said gear means being mounted on further spindles which pivot in said stator;

a sliding setting mechanism including a setting stem;

means for supporting said stem for sliding and rotating movement;

a sliding pinion mounted to slide along said stem but to rotate with said stem;

means mounted on said stator for responding to the sliding of said stem to move said sliding pinion between a rest position and an active position; and

a setting pinion mounted for rotation on said stator meshed with one of said gear means and positioned for meshing with said sliding pinion when said sliding pinion is in said active position, whereby rotation of said stem causes said sliding pinion to rotate said setting pinion which rotates said gear means to adjust the position of said spindles for the hands of a watch.

4,488,820

TIME SIGNALLING DEVICE FOR A TIMEPIECE WHICH PRODUCES MUSICAL SOUNDS

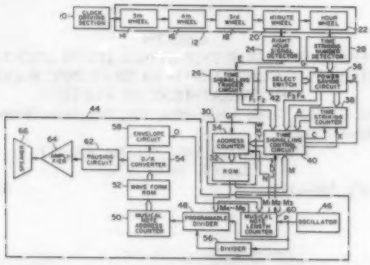
Katsuhiko Takebe, Machida, Japan, assignor to Rhythm Watch Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 243,353, Mar. 13, 1981,. This application Mar. 14, 1984, Ser. No. 589,050

Claims priority, application Japan, Mar. 24, 1980, 55-37227

Int. Cl.³ G04B *21/00*

U.S. Cl. 368—273 **11 Claims**



1. A time signalling device for a timepiece comprising:

hour signal detector cooperating with a minute wheel in the time indicating gear train to detect hour signal at an indicated time by the ON action of a hour detecting contact;

a time signalling trigger circuit for generating a time signalling trigger signal at a requested time and time signalling sound directing signal based on the hour signal of said hour signal detector;

a time striking number detector having a sliding contact composed of contact disc having a plurality of contact point group facingly installed to an hour wheel in the time indicating gear train for generating a time striking number signal corresponding to an indicated time of the timepiece;

an oscillator generating basic frequencies required to produce melody sounds and time striking sounds;

a programmable divider dividing said basic frequencies from said oscillator to generate frequencies of required musical notes;

a musical note length counter counting said basic frequencies from said oscillator to determine required length of musical notes;

ROM for memorizing melody sound data consisting of dividing ratio data of said programmable divider which produces determined musical notes and objective count value data of said musical note length counter which determines the required length of musical notes, time striking sound data consisting of dividing ratio data of said programmable divider which produces determined musical notes and objective count value data of said musical note length counter which determines the required length of musical notes, time signalling sound completion data, time striking commencement jump data, and time striking cycle jump data;

a time signalling sound selecting circuit having an address counter reading melody sound data and time striking sound data out of said ROM in response to said time signalling trigger signal;

a time striking counter receiving said time striking number signal for setting a number in said time striking counter corresponding to a value of said time striking number signal and for counting down said value and for outputting a time striking completion signal when the value is counted down to zero;

a time signalling circuit outputting requested melody sound data, reading the signal to said time signalling sound selecting circuit in accordance with said time signalling

sound directing signal, completing the time signalling action by said time signalling completion data of said ROM, outputting said time striking sound data reading signal to said time signalling sound selecting circuit by said time striking commencement jump data and said time striking cycle jump data of said ROM, and further completing said time signalling action by said time striking completion signal of said time striking counter;

a wave form ROM for memorizing the wave form of predetermined time signalling sounds as digital signals;

an address counter counting signals from said programmable divider to read the data from said wave form ROM one after another;

a D/A converter for converting the data from said wave form ROM to an analog signal; and

a sound generator producing the requested time signalling sound in accordance with the analog signal from said D/A counter.

4,488,821

METHOD AND MEANS OF RAPIDLY DISTINGUISHING A SIMULATED DIAMOND FROM NATURAL DIAMOND

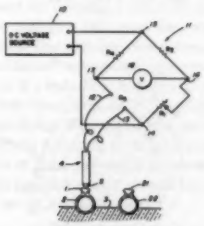
Joseph F. Wenckus, Needham, Mass., assignor to Ceres Electronics Corporation, Billerica, Mass.

Continuation of Ser. No. 240,126, Mar. 3, 1981, Pat. No. 4,364,677, which is a continuation of Ser. No. 885,502, Apr. 10, 1978, Pat. No. 4,255,962. This application Nov. 24, 1982, Ser. No. 444,212

The portion of the term of this patent subsequent to Mar. 17, 1998, has been disclaimed.

Int. Cl.³ G01N *25/18*

U.S. Cl. 374—44 **3 Claims**



2. A method of determining whether a test gem is a simulant gem or a gem which is simulated comprising the steps of:

subjecting the test gem to heat flow from an electrically powered thermoelectric device in a probe, the thermoelectric device being in close thermal relationship with a small gem contacting surface of the probe; and

measuring a thermally responsive electrical parameter of said thermoelectric device within about a few seconds.

4,488,822

TIME/TEMPERATURE INDICATOR

Timothy A. Brennan, Andover, Mass., assignor to Andover Monitoring Systems Corporation, Andover, Mass.

Filed Jan. 4, 1982, Ser. No. 336,834

Int. Cl.³ G01K *3/00*

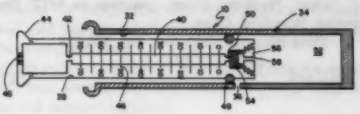
U.S. Cl. 374—101 **7 Claims**

1. A time/temperature indicator comprising:

a first compartment having an input passage and a spaced-apart exit passage;

a freezable fluid filling said first compartment;

a second compartment having pressurizing means, a second exit passage in fluid communication with said first input passage, and a compressible fluid in said second compartment; and



means for controlling the flow of compressible fluid from said second compartment to said first compartment.

4,488,823

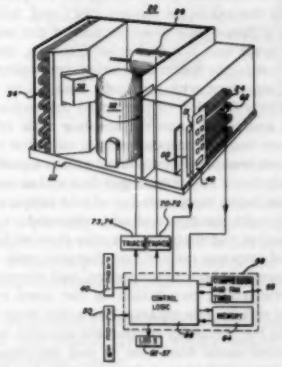
SELECTIVE TEMPERATURE CONTROL SYSTEM

Daniel A. Baker, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Division of Ser. No. 108,694, Dec. 31, 1979, Pat. No. 4,315,413. This application Nov. 2, 1981, Ser. No. 317,333

Int. Cl.³ G01K *3/00, 7/22*

U.S. Cl. 374—170 **5 Claims**



1. A method of determining the temperature to which a thermistor is exposed utilizing a capacitor, a reference resistor, means coupled to the capacitor and actuable to selectively charge the capacitor through either of the reference resistor and the thermistor, means actuable to discharge the capacitor and timing means coupled to the capacitor, comprising the steps:

(a) actuating the charging means to charge the capacitor through the reference resistor;

(b) operating the timing means to measure the length of time required to charge said capacitor to a predetermined level to obtain a reference charge time;

(c) actuating the discharging means to discharge the capacitor;

(d) actuating the charging means to charge said capacitor through said thermistor;

(e) operating the timing means to measure the length of time required to charge said capacitor to said predetermined level through said thermistor to obtain a temperature charge time; and

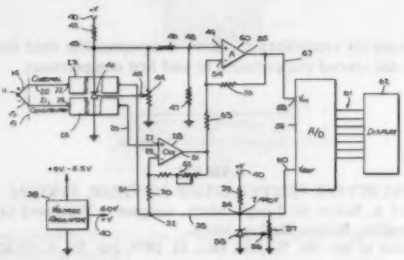
(f) computing the difference between the reference charge time and the temperature charge time and dividing the difference by the sum of said reference charge time and said temperature charge time to determine the temperature to which said thermistor is exposed.

4,488,824

METHOD AND APPARATUS FOR PRECISION TEMPERATURE MEASUREMENT

Robert J. Salem, Danbury, Conn., assignor to MIT Trading Corporation, Stamford, Conn.

Filed May 14, 1982, Ser. No. 378,418
Int. Cl.³ G01K 7/12
U.S. Cl. 374—181 **2 Claims**



1. A temperature measuring device for providing a signal representative of a temperature to be measured, comprising in combination a thermocouple for sensing the temperature to be measured, said thermocouple having a hot and cold junction for providing a first signal as a function of the temperature difference between said hot and cold junctions, means comprising a semiconductor thermal sensitive component arranged in a common structure with said cold junction to provide a second signal as a function of the actual temperature of said cold junction and based upon the absolute scale of temperature, and means coupled responsively to said first mentioned means and thermocouple for providing a third signal representative of the algebraic addition of said first and second signals, said third signal being representative of said temperature to be measured, said cold junction and said semiconductor component being coupled to a thermionic inertia element for equalizing the thermal response rates of said thermocouple cold junction and said semiconductor component, said thermionic inertia element comprising two bodies of the same conductive metal disposed side by side separated by a thin layer of electrically insulating but thermally conductive material, said bodies being of different metal from that of said thermocouple hot junction and connected to said thermocouple hot junction to provide said cold junction, said bodies defining an internal cavity, and said semiconductor component is mounted within said cavity.

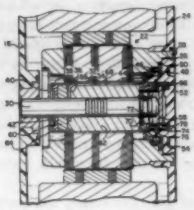
4,488,825

MOTOR BEARING AND SEAL ASSEMBLY

Erman V. Cavagnero; George A. English, and Charles R. Marracino, all of Torrington, Conn., assignors to Clevepak Corporation, White Plains, N.Y.

Division of Ser. No. 353,395, Mar. 1, 1982, Pat. No. 4,458,405.
This application Dec. 27, 1983, Ser. No. 565,985
Int. Cl.³ F16C 17/02
U.S. Cl. 384—152 **9 Claims**

1. A bearing and seal assembly for use in an electric motor or the like having a major annular element with a through bore adapted to receive the bearing and seal assembly and a shaft therewithin; said bearing and seal assembly comprising a soft deformable and smooth thin walled sleeve disposed in and secured to the wall of the bore, said sleeve having one end portion peripherally unrestrained by the bore wall at one end of the latter, a sleeve bearing disposed in the sleeve and in press fit engagement therewithin for retention therewithin, and an annular seal disposed in end-to-end relationship with the bearing and in the unrestrained end portion of the sleeve, said annular seal being in press fit engagement with the sleeve at its unrestrained end portion and having its shaft opening held in precise coaxial relationship with the shaft opening of the adjacent bearing by the sleeve end portion, the latter being slightly



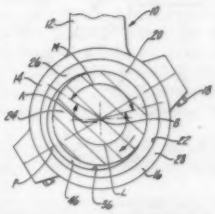
expanded by the press fit of the seal therewithin and accomodating any non-concentricity of parts whereby to maintain said precise coaxial relationship of said shaft openings.

4,488,826

OFFSET WALL BEARING

Ronald J. Thompson, Howell, Mich., assignor to Federal Mogul Corporation, Southfield, Mich.

Filed Sep. 30, 1982, Ser. No. 429,878
Int. Cl.³ F16C 9/02
U.S. Cl. 384—288 **5 Claims**



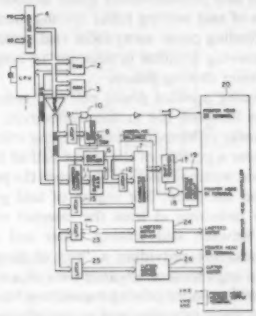
1. An angularly split journal bearing for a connecting rod of an engine which surrounds a cylindrical portion of a crankshaft, said crankshaft being subjected to loads exerted perpendicularly to the longitudinal axis of the crankshaft, with a maximum load being exerted upon the crankshaft from one direction through a high load portion of the bearing, said bearing being split into halves on a parting line disposed at an acute angle relative to the direction said maximum load is directed and comprising a steel backing strip having a cylindrical outer surface which is received within a bore in the connecting rod, said outer surface having a central axis B, and a lining of bearing material having an inner bearing surface for journaling said crankshaft, said inner bearing surface having a constant radius and central axis A which is offset from axis B generally less than one half the difference between the diameter of the inner bearing surface and the diameter of the cylindrical portion of the crankshaft, said offset being along the parting line away from the high load portion of the bearing to provide additional clearance between the inner surface and a crankshaft at a low load portion of the bearing and reduced clearance at the high load portion of the bearing.

4,488,827

CONTINUOUS VERTICAL LINE PRINT CONTROL SYSTEM

Tomoyuki Haganuma, Yokohama, Japan, assignor to Ricoh Company, Ltd., Japan

Filed May 5, 1983, Ser. No. 491,933
Claims priority, application Japan, May 6, 1982, 57-74535
Int. Cl.³ B41J *29/26, 3/12*
U.S. Cl. 400—17 **6 Claims**



1. A print control system for use in a printer capable of carrying out printing at a predetermined print line pitch with a selected one of a plurality of different kinds of fonts which are different in size, at least in height, said system comprising:

first storing means for storing a first set of line print data to be used for printing a (n−1)th print line, where n is a positive integer;

second storing means for storing a second set of line print data to be used for printing a nth print line which immediately follows said (n−1)th print line; and

additional vertical line printing control means for printing at least one additional vertical line between said (n−1)th and nth print lines if a reduction in height of font occurs due to change in font from said (n−1)th print line to said nth print line and if said first set of line print data includes at least one vertical line code and said second set of line print data includes at least one vertical line code located in the same column position as said at least one vertical line code in said first set of line print data.

4,488,828

TYPEWRITER FOR BRAILLE SYMBOLS AND PRINTED CHARACTERS

Naoto Ohtsuki, 60, Katakura-machi, Hachiohji, Tokyo, Japan

Filed Mar. 22, 1982, Ser. No. 360,679
Int. Cl.³ B41J *3/32, 3/42, 3/512*
U.S. Cl. 400—82 **10 Claims**

1. A typewriter for Braille symbols and print characters, comprising:

a housing;

a first support member extending vertically within said housing;

a second support member extending parallel to said first support member within said housing;

feeding means operatively positioned within said housing for feeding a recording medium;

Braille symbol typing means for embossing Braille symbols;

impact receiving means operatively positioned relative to said Braille symbol typing means for receiving said Braille symbol typing means for effecting a transfer of said Braille symbol unto a recording medium;

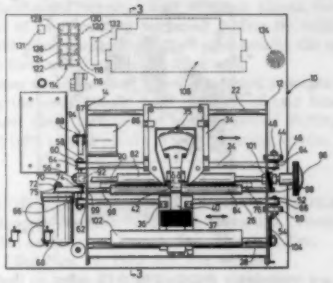
printed character typing means for producing printed characters;

first platform means operatively positioned within said housing for supporting said Braille symbol typing means on one side of a recording medium;

second platform means operatively positioned within said housing for supporting said print character typing means and said impact receiving means on the other side of a recording medium;

platform moving means for moving said first platform means and said second platform means between said first and second support members;

said platform moving means including a pulley shaft rotated by a stepping motor, a pair of pulleys mounted on end portions of said pulley shaft and first belt means and second belt means for bridging between said first platform means and second platform means and said pair of pulleys, respectively, wherein said platform moving means simultaneously, incrementally advances or retracts said platforms at least a single printed character width along a



print line extending between said first and second support members on a recording medium;

a keyboard operatively positioned on said housing and including a plurality of keys each one being selectively activated to type both Braille symbols and printed characters on a recording medium by means of said Braille symbol typing means and said printed character typing means; and

a casing for receiving a recording medium being provided beneath said Braille symbol typing means and printed character typing means;

wherein said Braille symbol typing means being provided at a different position in vertical orientation but at the same position along a print line relative to said printed character typing means and said Braille symbol typing means and impact receiving means being horizontally aligned with respect to each other.

4,488,829

MULTIBIN SHEET FEEDER FOR USE WITH A PRINTER

Kenjiro Hidaka, 2040 Pelham Ave., Los Angeles, Calif. 90025

Filed Jun. 2, 1982, Ser. No. 384,333
Int. Cl.³ B41J *11/58*
U.S. Cl. 400—605 **9 Claims**

1. A sheet feeder for use in combination with a printer which has a sheet inlet, said sheet feeder comprising:

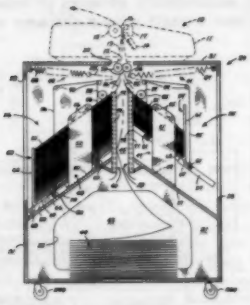
a. a frame which is substantially symmetrical about a bisecting vertical plane and which is divided into a first portion of said frame and a second portion of said frame, which are substantially identical to each other, by said bisecting vertical plane, said frame having a top which is in a first horizontal plane on which said printer is disposed;

b. a first tray which is disposed in said first portion of said frame and parallel to a first plane, which is slanted with respect to said first horizontal plane, and which is movably coupled to said frame, said first tray having a first leading edge adjacent, but not contiguous, to said vertical

bisecting plane wherein a first stack of sheets, face up, can be disposed parallel to said first plane on said first tray;

c. first sheet feeding means coupled to said frame for separating a first top sheet from said first stack of sheets and feeding said first top sheet toward said printer wherein the initial moving direction of said first top sheet defines a first sheet moving direction;

d. a second tray which is disposed in said second portion of said frame and parallel to a second plane, which is slanted with respect to said first horizontal plane, and which is movably coupled to said frame, said second tray having a second leading edge adjacent, but not contiguous, to said vertical bisecting plane wherein a second stack of sheets, face down, can be disposed parallel to said second plane on said second tray and wherein said first and second trays



are opposingly disposed to each other so that, when said first leading edge of said first tray and said second leading edge of said second tray are disposed in the same plane, which is parallel to said first horizontal plane and orthogonal to said bisecting vertical plane, said first and second trays form a generally inverted V-shape;

e. second sheet feeding means coupled to said frame for separating a second top sheet from said second stack of sheets and feeding said second top sheet toward said printer wherein the initial moving direction of said second top sheet defines a second sheet moving direction; and

f. a sheet outlet which is adjacent and contiguous to said top of said frame and which can be aligned with said sheet inlet of said printer whereby a sheet from said sheet feeder can be fed to said printer.

4,488,830

SHEET-BY-SHEET FEEDER WITH REFLEX PHOTO CELL LINE FEED CONTROL

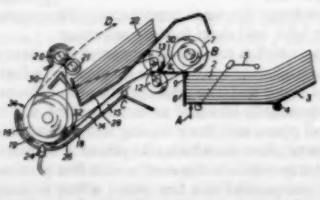
Kurt Rünzi, Küsnachterstrasse 59, 8126 Zumikon, Switzerland

Filed Mar. 4, 1983, Ser. No. 472,148

Claims priority, application Switzerland, Mar. 8, 1982, 1400/82

Int. Cl.³ B41J *13/02*

U.S. Cl. 400—636 **2 Claims**



1. Sheet feeder for feeding separate sheets of paper to an automatic writing machine having a writing roller around which paper may be led for writing thereon by a print-writing mechanism, a pressure-roller guide for holding paper between it and said writing roller after paper has been inserted therebetween and means for controllably driving said writing paper so as to advance paper past said print-writing mechanism, said sheet feeder further comprising:

means, including a sheet-by-sheet feed roller (**7**) driven by the rotary movement of said writing roller (**16**), for feeding paper sheet by sheet from a paper sheet supply stack and inserting a sheet, thus fed, in between said writing roller and said pressure-roller guide in coordination with operation of said writing roller driving means;

means for feeding paper away from said writing roller to a paper receiving location in response to operation of said writing roller driving means;

means including a reflex photo cell (**24**) responsive to the difference between the greater reflectivity of the paper and the lower reflectivity of said writing roller and fixedly located near a portion of the lower half of the circumference of said writing roller (**16**) between the paper insertion region and the paper exit region of said pressure-roller guide for detecting at least the inserted edge of paper arriving between said writing roller and said pressure roller guide, for providing a "top of form" signal by which the beginning of advancement of a sheet of paper by said writing roller driving means may be timed, and to advance a sheet of paper, and accurately past said print-writing mechanism, for writing thereon; and

control means (**41,42,47**), connected for activation by said "top of form" signal from said reflex photo cell, for advancing a sheet of paper accurately by stepwise operation of said writing roller driving means, and thereby bringing a desired line position on said sheet in position for beginning of writing.

4,488,831

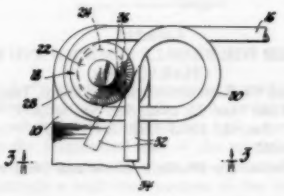
WIRE AND PIN CONNECTOR ARRANGEMENT

Lynn E. Waite, Gasport, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 9, 1983, Ser. No. 530,550

Int. Cl.³ F16G *11/00*

U.S. Cl. 403—209 **4 Claims**



1. A push-pull wire and pin connector arrangement comprising a pin having an annular groove, and a push-pull wire having both a first loop adapted to extend in and about and engage at its inner loop side with said groove and a deflectable second loop opposite said first loop adapted to be arranged external of said pin so that a portion of said second loop is deflectable to enable engagement of said first loop and said second loop in said groove and thereafter remains deflected to a reduced degree by engaging at its outer loop side with said groove opposite said first loop to thereby effect and maintain a spring-loaded tight connection between said wire and pin wherein said pin is encircled by said wire at said loops to positively prevent their disengagement by pushing or pulling on said wire.

4,488,832

LOCKING DEVICE FOR ATTACHING IMPLEMENTS TO CONVERTIBLE MACHINES

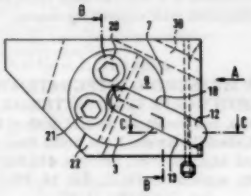
Alfred Kinshofer, Wendelsteinstrasse 8, 8160 Miesbach, Fed. Rep. of Germany

Filed Jun. 14, 1982, Ser. No. 388,190

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1981, 3123692

Int. Cl.³ F16B 21/09

U.S. Cl. 403—316 11 Claims



1. A locking device for attaching implements to convertible machines, preferably for fixing attachments to lifting slides of forklift trucks, the lifting slides comprise plate or rail-like supports adapted to carry the implements or attachments, the implements or attachments having retaining claws for interengaging with the supports, said locking device comprising a disc-shaped axle, a locking member rotatably mounted and axially immovably mounted on the disc-shaped axle, said axle adapted to be connected to the implement or attachment, said locking member being pivotally movable between open and locking positions and in its locking positon being adapted to be positively coupled to the axle by a retaining element, a radial groove being provided in the end face of said axle, a second groove defined in the outside surface of the locking member being aligned with said radial groove when said second groove is in its locking position, a forked retaining lever being pivoted in the groove of the axle, a pivot pin extending transversely through the axle, the forked retaining lever being pivoted on the pivot pin, and the forked retaining lever being pivotally movable into the groove of the locking member and adapted to be locked therein.

4,488,833

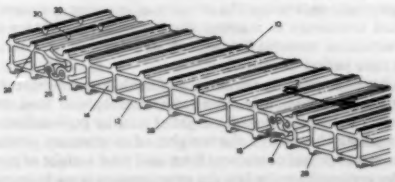
RAPIDLY DEPLOYED ASSAULT VEHICLE SURFACING OR TRACKWAY SYSTEM

Robert E. Perry, Danville, and William T. Myers, Jr., San Diego, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Apr. 27, 1982, Ser. No. 372,270

Int. Cl.³ E01C 9/08

U.S. Cl. 404—35 5 Claims



1. A transportable modular surfacing system comprising:

a plurality of rectangularly shaped planks, each of said planks having a first long side provided with a male portion and a second long side provided with a female portion, said male and female portions of adjacent planks being interengagable;

an elongated passage extending along the length of each of said long sides of each of said planks and being generally parallel to said male and female portions;

flexible continuous hinge members joining adjacent ones of said planks to each other to form said surfacing system, each of said hinge members having a generally rectangular base portion with first and second bulb portions extending along first and second long sides of said base portion, said first bulb portion of each of said hinge members being removably positionable within said elongated passage adjacent said male portion of a first of said planks and said second bulb portion of each of said hinge members being removably positionable within said elongated passage adjacent said female portion of a second adjacent one of said planks, said hinge member being connectable to said adjacent planks when said planks lie in intersecting planes thereby joining said adjacent planks so that said planks may be folded in an accordion fashion, said flexible continuous hinge members preventing the penetration of water, and the pumping of mud from beneath said modular surfacing and between said adjacent planks during traversal of said modular surfacing system by vehicles when said planks are positioned in substantially the same plane to form said surfacing system; and,

hinge retainer means secured in said elongated passages and abutting the ends of said bulb portions of said flexible continuous hinge members to prevent lateral shifting of adjacent ones of said planks in said surfacing system.

4,488,834

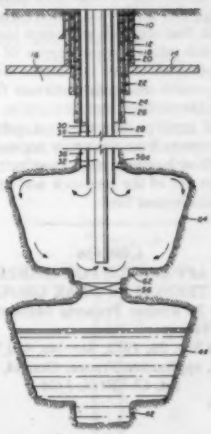
METHOD FOR USING SALT DEPOSITS FOR STORAGE

Mark W. Hooper, Houston, Tex., and Edward J. Voorhees, Tulsa, Okla., assignors to Empak, Inc., Houston, Tex.

Filed Nov. 17, 1982, Ser. No. 442,377

Int. Cl.³ B65G 5/00

U.S. Cl. 405—58 22 Claims



1. The method of using a salt deposit for storage comprising

drilling a well into the salt deposit;

creating a first storage cavity in the salt deposit by circulating raw water through the well;

evacuating the first storage cavity of all liquids;

injecting storage material into the first storage cavity;

sealing the first storage cavity by setting a plug in the well above the top of the first storage cavity;

creating a second storage cavity in the salt deposit above the plug by circulating raw water through the well;

evacuating the second storage cavity of all liquids;

injecting storage material into the second storage cavity;

sealing the second storage cavity by setting a plug in the well above the top of the second storage cavity;

reentering the second storage cavity by drilling through the plug above the second storage cavity; and

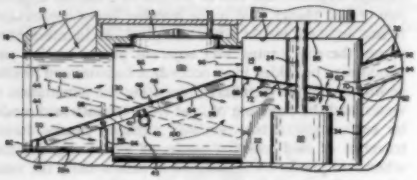
reentering the first storage cavity by drilling into the first storage cavity.

4,488,835

PENSTOCK FISH DIVERSION SYSTEM

George J. Eicher, Portland, Oreg., assignor to Eicher Associates, Inc., Portland, Oreg.

Division of Ser. No. 312,189, Oct. 16, 1981, abandoned. This application Nov. 22, 1983, Ser. No. 553,882
Int. Cl.[3] E02B *5/08, 8/08;* A01K *61/00;* B01D *33/00*
U.S. Cl. 405—83 4 Claims



1. A method of conveying downstream migratory fish around a dam including a penstock housing a water intake for a turbine powered by water stored behind the dam, the method comprising:

providing a penstock at an elevation spaced below an upper atmospheric surface of the water stored behind the dam so as to provide a water pressure at said elevation which is sufficient to drive a turbine;

admitting water and any fish therein from behind the dam into the penstock so as to fill the penstock with water under said pressure and to establish a downstream flow of water through the turbine at a first velocity within the penstock such that said fish are swept into the penstock;

diverting said fish into an upper region of the water-filled pressurized penstock above said intake while allowing all but a small portion of the downstream flow of water to pass through the turbine; and

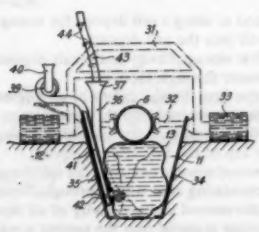
discharging said small portion of water and any fish therein under said pressure from the upper region of the penstock in a bypass flow having a second velocity such that the fish are swept out of the penstock and discharged below the dam in said bypass flow.

4,488,836

METHOD AND APPARATUS FOR EMBEDDING A PIPE IN A TRENCH IN WEAK GROUND

Francis R. Cour, 34 Avenue Francois Mansart, Maisons-Laffitte, Yvelines, France

Filed Sep. 30, 1982, Ser. No. 430,758
Claims priority, application France, Oct. 14, 1981, 81 19335
Int. Cl.[3] F16L *1/04*
U.S. Cl. 405—159 25 Claims



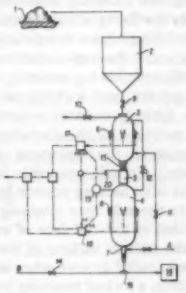
1. A method of embedding a pipe in ground consisting of materials having poor cohesion, comprising the steps of: continuously digging a trench having lateral walls progressively lengthwise under said pipe, replacing materials removed from said trench by continuously delivered collapsible wall-supporting means in the entire trench, in such a manner that said collapsible wall-supporting means applies pressure against said lateral walls of said trench to prevent said walls from collapsing, and then continuously reducing the volume of said collapsible wall-supporting means to allow the descent and positioning of said pipe in said trench and to allow said lateral walls of said trench to collapse, at a point remote from the delivering point of said collapsible wall supporting means.

4,488,837

METHOD FOR MEASURING INTEGRATED WEIGHT OF PARTICULATE FEED MATERIAL

Takumi Mizokawa, and Fumitaka Suzuki, both of Kobe, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Aug. 23, 1982, Ser. No. 410,555
Claims priority, application Japan, Jul. 14, 1981, 56-110600
Int. Cl.[3] B65G *53/66*
U.S. Cl. 406—34 3 Claims



1. A method for measuring an integrated weight of a particulate material being continuously fed to a powder treating system or the like by utilizing a pressurized carrier gas and providing a powder delivery port in a lower portion of a pressurized powder feed container for supplying said particulate material into a blowing port of said treating system, which comprises:

connecting a pressurized powder replenishing container to an upper portion of said powder feed container for replenishing said powder feed container with said particulate material under pressure;

continuously feeding the particulate material along with part of said pressurized carrier gas introduced into said delivery port of said pressurized powder feed container;

communicating said powder replenishing and feed containers with each other with suitable timing for replenishing said particulate material;

sequentially measuring the weights of powder contents in said containers to measure the integrated weight of the particulate material fed through said delivery port during a time period of operation;

batchwise combining the weight of each powder replenishment from said replenishing container to said feed container to obtain the total weight of powder replenishment;

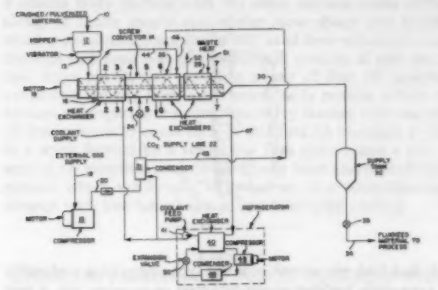
subtracting the sum of the weights of momentary powder contents of said containers from said total weight of powder replenishment when the measurement is made in concurrence with a replenishing operation; and

subtracting the weight of momentary powder content of said powder feed container from said total weight of powder replenishment when the measurement is made at a point in time falling outside the time period for replenishing operation.

4,488,838
PROCESS AND APPARATUS FOR FEEDING PARTICULATE MATERIAL INTO A PRESSURE VESSEL

Frank R. Herud, Williamsville, N.Y., assignor to Textron Inc., Providence, R.I.

Filed May 24, 1982, Ser. No. 381,409
Int. Cl.³ B65G 53/48
U.S. Cl. 406—56 8 Claims



1. A process for continuously feeding a finely particulate solid supply material such as coal or the like from a relatively low pressure ambience into a pressure vessel under higher pressure, said process comprising:

mechanically transporting said supply material through an enclosing barrel from a lower pressure inlet end thereof to a high pressure discharge end thereof which is in flow communication with said pressure vessel, while heating said barrel adjacent to said discharge end; and

supplying throughout the process a liquefied carrier gas under pressure into the interior of said barrel intermediate said inlet and discharge ends, wherein said liquefied gas is fed into said barrel at a rate such as to form a liquid slurry with said supply material within an intermediate portion of said barrel;

some portion of said liquefied gas being forced to advance upstream through the interstices of said supply material towards said inlet end in response to higher pressure existing at said discharge end;

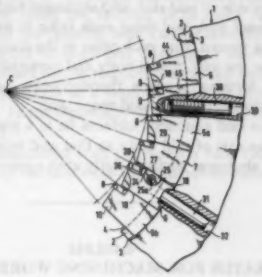
whereupon said portion of said liquefied gas cools by expansion and solidifies into solid particles which cooperate with said supply material being mechanically moved through said barrel so as to form a block against pressure differential induced fluid flow towards said inlet end in response to the higher pressure at said discharge end.

4,488,839
INTERNAL DISK MILLING CUTTER

Günter Wermeister, Ratingen, and Josef Noy, Kerken, both of Fed. Rep. of Germany, assignors to Santrade Ltd., Luzern, Switzerland

Filed Apr. 28, 1982, Ser. No. 372,714
Claims priority, application Fed. Rep. of Germany, May 23, 1981, 3120588; Jul. 7, 1981, 3126710
Int. Cl.³ B23C 5/22
U.S. Cl. 407—43 5 Claims

1. An internal disk milling cutter for the external cylindrical milling of workpieces, said cutter including a one-piece annular base having an internal circumferential edge and a series of radially inwardly extending holders removably arranged 360 degrees around said internal edge in a circumferentially uninterrupted manner so as to be capable of exerting circumferential forces against one another, said holders carrying tool bits and each including first abutment means and said base including second abutment means against which said first abutment means bears in a radial direction to support said holders in such radial direction, said holders each including third abutment means and said base including fourth abutment means against which said third abutment means bears in an axial direction to support said holders in such axial direction, a selected plurality of said removable holders of said series being of generally circular-segment configuration and including radially outwardly diverging frontal surfaces arranged to exert circumferential forces against associated frontal surfaces of circumferentially adjoining removable holders to prevent radially inwardly movement of said plurality of holders, the frontal surfaces of one other of said holders being of non-diverging relationship in the radially outward direction, at least a first of



said plurality of holders which adjoins said one other holder having a frontal surface which is generally parallel to the opposing frontal surface of said one other holder, a clamping wedge disposed in either of said opposing frontal surfaces of said one other holder and said first holder and arranged to act in a circumferential direction against the other said opposing surface, to push all of said holders of said series together in the circumferential direction, and a plurality of retaining means associated with same but not all of said holders of said series for releasably securing same to said base.

4,488,840
ROTARY CUTTING TOOL

Bernard M. Pollington, 110 6th St., Marion, Mich. 49665

Filed Jul. 8, 1982, Ser. No. 396,242
Int. Cl.³ B23B 29/10
U.S. Cl. 408—231 5 Claims

1. A rotary cutting tool comprising:

an elongated body adapted to be rotatably driven around its longitudinal axis, said body having an axially extending slot formed at one end,

a triangular and planar cutting insert having two sides, a cutting edge and two mounting edges, said mounting edges forming a corner and diverging from each other at a predetermined angle and lying in a plane perpendicular to the sides of the cutting insert,

a pair of abutment surfaces formed on said body and extending inwardly into said slot, said abutment surfaces diverging from each other at said predetermined angle,

said cutting insert being insertable into said slot so that said mounting edge engage said abutment surfaces and orient said cutting insert to a predetermined position with respect to body,

means for securing said cutting insert to said body,

wherein one abutment surface extends inwardly into said slot from one side of said slot and wherein the other abutment surface extends inwardly into said slot from the other side of said slot, said abutment surfaces each having an inner end, said inner ends lying in parallel planes and being spaced from each other in the direction perpendicular to the axis of said body and perpendicular to said slot and forming a space therebetween, said corner being positioned through said space, and

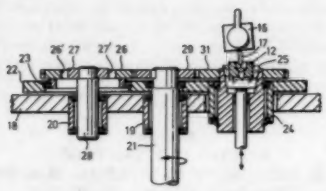
wherein said abutment surfaces lie in a plane perpendicular to the axis of said body so that said mounting edges and said abutment surfaces flatly abut against each other.

4,488,841

APPARATUS FOR MACHINING WORKPIECES TO A PREDETERMINED SHAPE

William A. Brown, 9 Jasper Crescent, Bramalea, Ontario, Canada

Filed Jun. 2, 1982, Ser. No. 384,182
Int. Cl.³ B23D *1/20*; B23B *3/28*
U.S. Cl. 409—292 **15 Claims**



1. Apparatus for machining a workpiece to a predetermined contour in accordance with a reference pattern comprising:

a support structure,

a first carrier mounted thereon, said first carrier including means defining first and second axes lying parallel to one another,

a second carrier mounted on the first carrier for pivotal movement about said first axis, the second carrier including means defining third and fourth axes lying parallel to the first and second axes,

a cam mechanism defining said reference pattern, the cam mechanism comprising a first cam member mounted on the second carrier for rotation about said third axis, and a second cam member mounted on the first carrier for rotation about said second axis,

means biasing the second carrier in one direction to urge said cam members into cooperative interengagement whereby oscillatory pivotal movement of the second carrier is produced in response to rotation of the interengaging cam members about their respective axes,

a workpiece holder mounted on the second carrier for rotation about said fouth axis,

drive means interconnecting the first cam member with the workpiece holder for rotating the workpiece holder in synchronism with the first cam members, and,

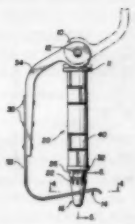
means for mounting a machining tool in operative relationship to a workpiece mounted in the workpiece holder.

4,488,842

NOSE MEMBER FOR AN EXPANDIBLE BUSHING TYPE LOCKING ASSEMBLY

Richard A. Deutsch, Encino, Calif., assignor to Adjustable Bushing Corp., North Hollywood, Calif.

Filed May 24, 1982, Ser. No. 381,724
Int. Cl.³ F16B *21/14*
U.S. Cl. 411—33 **9 Claims**



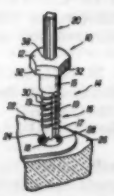
1. In a lock pin assembly of the type comprising a plurality of expansible bushing means mounted on an inner pin, a preload adjusting nut threadedly mounted on the free end of said inner pin, a clip means pivotally mounted on the other end of said inner pin and having a cam portion adapted to operate said plurality of expansible bushings on said inner pin between said cam portion and said nut, said clip means comprising a spring clip means at the free end thereof formed with an opening to clip over the free end of said inner pin, a nose member threadedly mounted on the free end of said inner pin outboard of said adjusting nut thereon, said nose member having a circular cross-sectional shape in planes perpendicular to the axis of said inner pin, means for securing said nose member to said extending end of said inner pin in an adjusted position of said nose member against said adjusting nut, said securing means comprising a plurality of crenelations formed in the end of said nose member which will face said nut in the assembled condition of said nose member on said pin, and said securing means further comprising a lock pin fitted into a pair of opposed ones of said plurality of crenelations and in an opening formed in said free end of said inner pin aligned with said pair of said crenelations.

4,488,843

REUSABLE ONE PIECE DRIVE FASTENER

Jean R. Achille, Forest Park, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jul. 16, 1982, Ser. No. 399,034
Int. Cl.³ F16B *13/08*
U.S. Cl. 411—41 **4 Claims**



1. A plastic fastener comprising a head, a shank and a drive pin, said head and shank being integrally formed with an axial bore traversing through said head and extending throughout said shank, said shank including a cylindrical portion and a bifurcated portion at the distal end which defines a pair of radially movable leg members separated by a laterally extending slot, helically disposed screw threads on at least a portion of said bifurcated portion, a pair of first grooves formed the length of said head portion and said shank portion in a radially

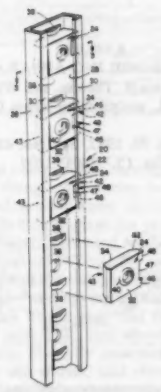
outward direction along said axial bore in alignment with said pair of leg members, a pair of second grooves formed in a radially outward direction along said axial bore through said head and said cylindrical portion and in direct alignment with said lateral slot, said axial bore having a conical configuration along said bifurcated portion which tapers to a smaller cross section towards said distal end, and said drive pin having a length slightly less than the length of said axial bore and having a central body portion with the same uniform cross section along its entire length and of the same shape and slightly smaller size than the portion of said axial bore which traverses through said head and said cylindrical portion of said shank, said drive pin further including a pair of first rib members projecting radially from said central body portion which are located to cooperate in a complementary manner with said pair of first grooves to cause each of said first rib members to ride in a track formed by a respective first groove and a pair of second rib members projecting radially from said central body portion which are located to cooperate in a complementary manner with said lateral slot in said bifurcated portion.

4,488,844

FLOATING FASTENER RETAINER ASSEMBLY WITH REMOVABLE FASTENERS

Richard C. Baubles, Maplewood, N.J., assignor to Jacobson Mfg. Co., Inc., Kenilworth, N.J.

Filed Jun. 7, 1982, Ser. No. 386,102
Int. Cl.³ F16B *39/00*
U.S. Cl. 411—85 **34 Claims**



1. A fastener assembly comprising a channel member having a web portion and two spaced flange portions extending from a same side of the web portion, each of the flange portions including an edge turned in towards the other flange portion, the inturned flange edges being spaced apart to define an opening therebetween into the channel member,

at least one fastener having opposed spaced apart faces and a pair of opposed side surfaces extending between the opposed faces defining a base which is disposed in the channel member between the web portion and the inturned flange edges thereof,

the channel member and the fastener base being configured and sized so that the fastener base when disposed in the channel member between the web portion and the inturned flange edges of the channel member is captivated therein while having limited movement relative to the channel member,

configuration associated with the fastener base for facilitating insertion of the base into the channel member through the opening comprising an inclination of at least a portion of at least one of the side surfaces at an obtuse angle with the face of the fastener base facing the web portion when the base is disposed in the channel member such that the distance between side surfaces along said one face of the fastener base facing the web portion is less than the corresponding distance along the other face of the fastener base, said distances along opposed faces and said opening being selected so that the fastener base can be inserted into the channel member with a side surface thereof disposed between one inturned flange edge and the web portion of the channel member and the inclined portion of the opposed side surface resting on the opposed inturned flange edge, the rigidity of the flange portions, said opening and said distances along the fastener faces being further selected so that the fastener base can be inserted into the channel member through said opening to seat both side surfaces disposed below respective inturned flange edges upon the application of a predetermined relatively small force which flexes elastically at least one of the flange portions, and

configuration associated with the fastener base for facilitating removal of the base from the channel member through the opening.

4,488,845

PAPER PADDING OR TABLETING PRESS

Gilbert J. Dupré, 221 Florida St., Baton Rouge, La. 70801

Filed Jul. 23, 1982, Ser. No. 401,067
Int. Cl.³ B42B *5/00*; B42C *3/00, 9/00*
U.S. Cl. 412—10 **10 Claims**

1. A modular, compact padding press capable of being quickly assembled and disassembled comprising:

a. a base means having slidable drawer means therein, said slidable drawer means having trough means therein for receiving and containing glue or adhesive which may drip from said stack of paper or other sheet material,

b. a paper support means tiltably connected to said base means, said paper support means having dowel means connectable thereto; and

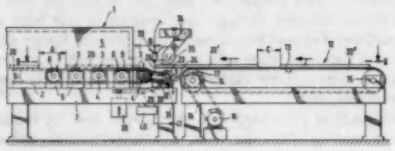
c. pressure plate assembly means rigidly connectable to said dowel means for firmly pressing paper or other sheet material against said paper support means, said pressure plate assembly having locking means for locking said pressure plate assembly on said dowel means after said pressure plate assembly is lowered onto the top of a stack of paper or other sheet material resting on said paper support means, said pressure plate assembly means having lever arm means pivotally connected thereto for exerting additional pressure upon said paper to other sheet material resting on said paper support means.

4,488,846

PROCESS AND DEVICE FOR FEEDING GLASS SHEETS TO A FURNACE

Friedrich Halberschmidt, Herzogenrath; Josef Audi, Aachen, both of Fed. Rep. of Germany; Herbert Radermacher, Raeren, Belgium, and Heinz Uberwolf, Herzogenrath, Fed. Rep. of Germany, assignors to Saint Gobain Vitrage, Neuilly-sur-Seine, France

Filed Nov. 30, 1981, Ser. No. 326,130
Claims priority, application France, Dec. 1, 1980, 80 25437
Int. Cl.³ C03B 35/16, 25/08
U.S. Cl. 414—152 7 Claims



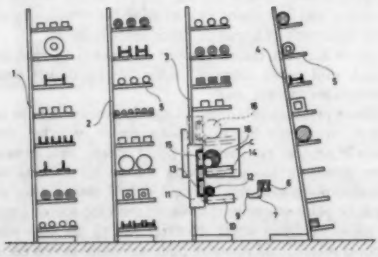
1. A device for feeding glass sheets to a furnace including a horizontally extending main conveyor continuously movable at a constant speed through said furnace and which is adapted to support a plurality of glass sheets spaced apart along the conveyor at a predetermined distance, characterized in having an auxiliary conveyor with a separate drive from said main conveyor adapted to feed glass sheets to an entry end of the main conveyor, a detector for detecting the leading edge of a glass sheet supplied to said entry side to stop said auxiliary conveyor, a distance measuring means for measuring the distance between the trailing edge of a sheet on the main conveyor and leading edge of a sheet on the auxiliary conveyor, sheet transfer means responsive to said distance measuring means when said auxiliary conveyor is stopped for transferring a sheet from the auxiliary conveyor to the main conveyor when the distance measured by said distance measuring means equals said predetermined distance, and means drivingly connecting said sheet transfer means and said main conveyor drive whereby each sheet is transferred to said main conveyor at a speed of movement substantially equal to said constant speed.

4,488,847

APPARATUS FOR STORING ROD-SHAPED MATERIAL

Paul Stolzer, Achern, Fed. Rep. of Germany, assignor to KEURO Maschinenbau Gesellschaft mit beschränkter Haftung & Co. Kommanditgesellschaft, Achern, Fed. Rep. of Germany

Filed Jun. 16, 1982, Ser. No. 389,113
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1981, 3133108
Int. Cl.³ B65G 1/04
U.S. Cl. 414—222 4 Claims



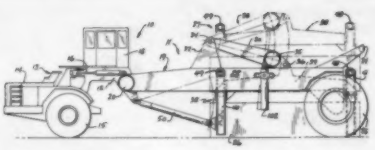
1. An apparatus for storing and supplying rod-shaped material to a cutting machine comprising a shelving unit including a plurality of carrier arms arranged one above another to form shelving compartments for holding rod-shaped material; each shelving compartment extending horizontally in a length dimension of said shelving unit; a crane bridge moveable with respect to said shelving unit for removing rod-shaped material from and placing rod-shaped material into said shelving compartments, wherein the improvement comprises first and second rollways each forming a substantially horizontal support for carrying rod-shaped material thereon; said first and second rollways extending horizontally parallel to said length dimension and being vertically spaced from one another; and vertically displaceable means carrying said first and second rollways; said vertically displaceable means having a first position in which said first rollway assumes a cutting machine loading position for delivering rod-shaped material length-wise to and receiving unused rod-shaped material length-wise from a cutting machine; in said first position of said carrying means said second rollway assumes a first supplying position situated above said cutting machine loading position for cooperating with said crane bridge whereby rod-shaped material is deposited on said second rollway or is taken therefrom by said crane bridge; said vertically displaceable means having, underneath said first position, a second position in which said second rollway assumes said cutting machine loading position and said first rollway assumes a second supplying position situated underneath said cutting machine loading position for cooperating with said crane bridge whereby rod-shaped material is deposited on said first rollway or is taken therefrom by said crane bridge.

4,488,848

LOAD HANDLING APPARATUS

Edward S. Kress; Dennis R. Thomas, and William L. LaBerdia, all of Brimfield, Ill., assignors to Kress Corporation, Brimfield, Ill.

Filed Sep. 30, 1982, Ser. No. 428,751
Int. Cl.³ B60P 3/00
U.S. Cl. 414—460 10 Claims



1. A load handling apparatus comprising, in combination,

a main frame having a pair of main support beams arranged substantially parallel and spaced apart from one another by an amount sufficient to straddle the load to be handled;

a single lift frame spanning the space between the main support beams, the lift frame having two side members and a cross member, each side member being pivotally mounted at one end to the main support beams at a first set of transversely aligned pivot points, and each said side member being rigidly connected at the other end to the cross member, the lift frame being movable between a lowered position in which portions of the lift frame including the cross member may rest on the main support beams and a raised position in which the portions of the lift frame are pivoted up and away from the main support beams, the difference in elevation of the lift frame portions relative to the main frame between raised and lowered positions providing the lifting capability of the lift frame;

a tong subassembly supported from the cross member at a second set of transversely aligned pivot points, the second set of pivot points being longitudinally spaced from the first set of pivot points;

means for actuating said lift frame to raise and lower the tong subassembly relative to the main frame;

means for actuating the tong subassembly for clamping onto the load; and

a load stabilizing link, the opposite ends of the link being pivotally connected between the main frame and the tong subassembly at longitudinally spaced pivot points, the first and second sets of pivot points and the pivot points of the ends of the load stabilizing link forming substantially a parallelogram when viewed from the side whereby the tong subassembly mechanism is maintained in substantially the same orientation relative to the ground as the lift frame is raised and lowered.

4,488,849

POWER SHOVEL

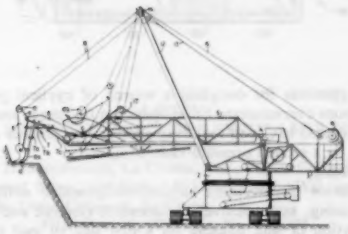
Klaus Klucker, Lübeck, Fed. Rep. of Germany, assignor to O & K Orenstein & Koppel Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 427,574

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1981, 3140223

Int. Cl.³ B65G *47/16*

U.S. Cl. 414—566 **4 Claims**



1. A power shovel comprising a carriage, a boom supported on said carriage for lifting and lowering movement, a hydraulically operated shoveling mechanism mounted at a front end of said boom away from said carriage for pivotal motion about a horizontal axis, a shovel connected to said shoveling mechanism, at least one cable pulley rotatably mounted to said shoveling mechanism, a cable hoisting gear engaged with said boom for moving said boom and having a cable reeved on said at least one cable pulley for moving said shoveling mechanism with movement of said cable, said shoveling mechanism including a shovel arm pivotally mounted to said boom and pivotally receiving said shovel, said shovel arm having at a rear end thereof facing said boom a bracket for carrying said at least one cable pulley, said at least one cable pulley being mounted at an upper end of said bracket, and a shovel jib pivotally mounted to said boom and pivotally receiving said bracket at a point on said bracket between said at least one cable pulley and said shovel.

3. A power shovel comprising:

a platform (2);

a boom (5) having one end pivotally mounted to said platform for pivotal movement about a horizontal axis, said boom including a conveyor for moving material from an opposite end of said boom to said one end of said boom;

a first pulley set (17) connected to said boom for guiding a cable;

a hydraulically operated shoveling mechanism (7) mounted to said opposite end of said boom for pivotal movement about a horizontal axis, said shoveling mechanism including a pivotally mounted shovel arm (9) for pivotal movement about a horizontal axis having a lower end and an upper end;

a shovel (10) pivotally mounted to said lower end of said shovel arm;

a second pulley set (19) for guiding a cable connected to said upper end of said shovel arm; and

cable wench means (16) connected to said platform and including a cable (15,18) reeved over said first and second pulley sets for synchronized movement of said shovel arm and said boom whereby said shovel can be pivoted into a position over said opposite end of said boom while said opposite end of said boom is lowered through the action of said wench means and said cable.

4,488,850

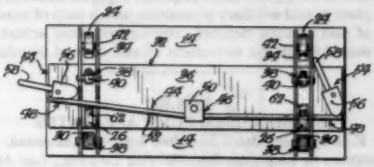
COUPLER ASSEMBLY

Theodore A. Wernimont, Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Aug. 19, 1982, Ser. No. 409,509

Int. Cl.³ E02F *3/74*

U.S. Cl. 414—723 **21 Claims**



1. A coupler assembly for attaching a work implement to a lift arm assembly, the coupler assembly comprising:

(a) a frame member adapted for mounting on the lift arm assembly;

(b) an attachment structure on one of the work implement and the frame member, the attachment structure defining a first recess opening in one direction and a second recess opening in an opposite direction;

(c) first latching means on the other of the implement and frame member, the first laching means for being received by the first recess; and

(d) second latching means on the other of the implement and frame member for engaging with the second recess, the second latching means including a bar means having a mounting portion mounted on the other of the implement and frame member and an end portion deflectable with respect to the mounting portion, the end portion being deflectable from a disengaged position to an engaged position by bending flexure of said bar means wherein the end portion is received by and engaged with the second recess; whereby the first latching means and the second latching means cooperate with the attachment structure to releasably attach the implement on the frame member.

4,488,851

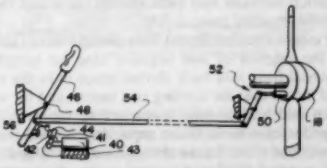
POWER MANAGEMENT SYSTEM

Harvey R. Young, Williamsburg, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 1, 1982, Ser. No. 364,573

Int. Cl.³ B64C *11/46*

U.S. Cl. 416—33 **2 Claims**



1. A power management system for managing the power from at least one power plant of a flying vehicle having a main

and at least one auxiliary propulsion unit powered by the power unit comprising:

a signal generator for generating a first signal which is proportional to the power available from the power plant; and

a circuit connected to said main propulsion unit which receives said first signal and has an output that varies according to the power used by the main propulsion unit and which generates a second signal which is proportional to the power remaining for the auxiliary propulsion unit,

a signal conditioner adapted to receive said second signal, to provide amplification, filtering and processing of the second signal, and adapted to control a limit actuator connected to said signal conditioner and having an element extending by an amount proportional to said second signal, the flying vehicle including a control member movable to vary the amount of power supplied from the power plant to said auxiliary propulsion unit, a path of movement of said control member crossing said limit actuator element to limit the movement of said control member.

4,488,852

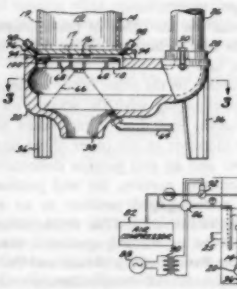
SUBMERSIBLE PUMP APPARATUS

Earl E. Ivins, and John L. Ivins, both of Lakewood, Calif., assignors to Engineers Sales-Service Co., Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 947,170, Sep. 28, 1978, abandoned, which is a continuation-in-part of Ser. No. 745,332, Nov. 26, 1976, Pat. No. 4,134,711. This application Dec. 8, 1980, Ser. No. 213,922

Int. Cl.³ F04B *39/06*

U.S. Cl. 417—211.5 **2 Claims**



1. In a submersible pump adapted for location in a sump or the like and including a motor case and a driving motor in said motor case; an impeller case having an upper, interiorly disposed face, an inlet for receiving liquid material from the sump, and an outlet for discharging liquid material out of the sump; and an impeller located in said impeller case and defining a back shroud space with said face, said impeller being rotatable for developing a low pressure vortex below said impeller adjacent said inlet, the improvement comprising:

vent means defining vent passage means providing communication between said back shroud space and the exterior of said impeller case;

spray means coupled to said vent passage means and opening to the exterior of said impeller case for spraying liquid material from said back shroud space onto the exterior of said motor case for cooling said motor, and for venting air from said back shroud space and to the exterior of said impeller case to facilitate repriming of said pump under conditions of air intake through said inlet; and

liquid material discharge control means for controlling the quantity of liquid material discharged through said outlet, independently of the rate of rotation of said impeller, said control means comprising a compressor, conduit means terminating at one end adjacent said low pressure vortex area and coupled at the other end to said compressor for injection of compressed air into said low pressure vortex for discharge through said outlet with said liquid material.

4,488,853

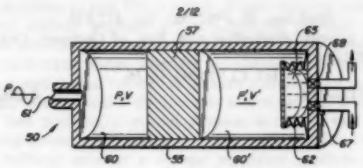
FLUID PRESSURE RATIO TRANSFORMER SYSTEM

Glendon M. Benson, Danville, Calif., assignor to New Process Industries, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 182,185, Aug. 28, 1980, abandoned, which is a continuation of Ser. No. 937,904, Aug. 29, 1978, abandoned. This application Mar. 19, 1982, Ser. No. 360,094

Int. Cl.³ F04B *17/00*

U.S. Cl. 417—240 **14 Claims**



1. Apparatus for coupling a source of cyclical pressure oscillations characterized by an operating frequency and a first pressure ratio to a load requiring pressure oscillations characterized by a second pressure ratio comprising:

a housing;

a positive displacement element reciprocable within said housing, said positive displacement element and a first portion of said housing on a first side of said positive displacement element defining a first chamber, said positive displacement element and a second portion of said housing on the other side of said positive displacement element defining a second chamber;

first and second separate compressible fluids filling said first and second chambers, respectively;

means for coupling said source of pressure oscillations to said first chamber to cause reciprocation of said positive displacement element, thereby giving rise to cyclical pressure oscillations in said second compressible fluid; and

means for coupling said second chamber to said load wherein kinetic energy of said positive displacement element may be transferred to said load during a portion of each cycle;

the reciprocation of said positive displacement element being characterized by a resonant frequency defined at least in part by the effective spring coefficient of said first and second compressible fluids and the effective mass of said positive displacement element, said effective mass and effective spring coefficient being chosen so that said resonant frequency is generally near said operating frequency whereupon said positive displacement element operates sufficiently close to resonance to cause inertial compression of said second compressible fluid and thereby produce pressure ratio transformation wherein the pressure oscillations in said second compressible fluid are characterized by said second pressure ratio.

4,488,854

CONSTRAINED WAVE PUMP

Richard B. Miller, R.R. 2, Box 723, Spencer, Ind. 47460

Filed Apr. 12, 1982, Ser. No. 367,375

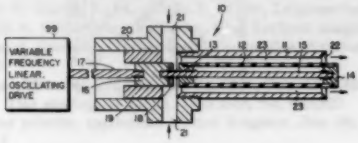
Int. Cl.³ F04B *19/22, 21/04*

U.S. Cl. 417—241 **2 Claims**

1. A constrained wave fluid pump comprising:

(a) a hollow tubular member, the interior of said hollow tubular member defining a wave constraining surface;

(b) an elastic wave medium, said elastic medium including a cylindrical member which is concentrically positioned inside said hollow tubular member, said elastic wave medium and said wave constraining surface defining a channel therebetween, said channel having an entrance port and an exit port; and



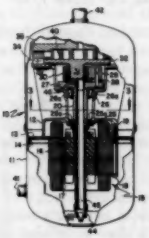
(c) wave generation means for generating waves in said elastic wave medium, the peaks of said waves forming fluid seals with said wave contraining surface to cause a fluid pumping action in said channel from said entrance port to said exit port.

4,488,855

MAIN BEARING LUBRICATION SYSTEM FOR SCROLL MACHINE

Arthur L. Butterworth, La Crosse, Wis.; James C. Tischer, La Crescent, Minn., and Robert E. Utter, Genoa, Wis., assignors to The Trane Company, La Crosse, Wis.

Filed Dec. 27, 1982, Ser. No. 453,304
Int. Cl.³ F04B *39/02*; F01C *1/02, 21/04*
U.S. Cl. 417—368 **13 Claims**



1. In a scroll apparatus, a system for lubricating a drive shaft main bearng, comprising

a. an oil pump connected to the drive shaft and having an inlet submerged in an oil reservoir and an outlet in fluid communication with a spatial volume into which oil circulated by the pump is dispersed generally radially outward from the drive shaft as a mist of oil droplets, said spatial volume being disposed adjacent one end of the drive shaft main bearing and in fluid communication with said one end thereof;

b. a frame supporting the drive shaft main bearing and defining a chamber disposed immediately adjacent the other end of the drive shaft main bearing, said chamber being in fluid communication with the spatial volume; and

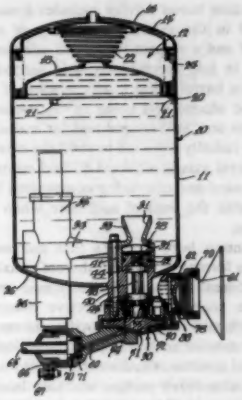
c. fan means disposed within the chamber, rotatably driven by the drive shaft and operative to draw fluid carrying the oil entrained therein as a mist generally radially inward toward the drive shaft and into the chamber through the drive shaft main bearing, thereby lubricating the bearing.

4,488,856

HYDRAULIC POWER SUPPLY WITH HERMETIC SEALING OF HYDRAULIC FLUID AND SEALING METHOD

John M. Preble; John A. Anderson, and Lawrence D. McGee, all of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Sep. 26, 1983, Ser. No. 535,591
Int. Cl.³ F04B *17/00*
U.S. Cl. 417—409 **10 Claims**



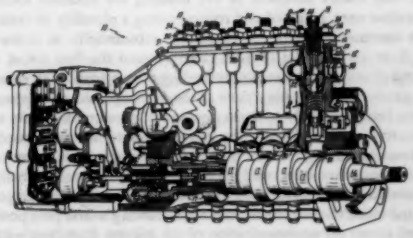
9. A hydraulic power supply having an oil reservoir and means for pumping oil from the reservoir comprising a pump within the reservoir and a gas turbine drivingly connected to the pump and having a turbine cavity, the improvement comprising a pair of burst discs sealing said turbine cavity and a quantity of oil filling the turbine cavity during storage and before operation of the turbine.

4,488,857

MOUNTING ARRANGEMENT FOR INJECTION BARREL IN HOUSING OF FUEL INJECTION PUMP

John A. Kimberley, East Granby, Conn., and John B. Cavanaugh, West Springfield, Mass., assignors to AMBAC Industries, Incorporated, Springfield, Mass.

Filed Feb. 17, 1983, Ser. No. 467,558
Int. Cl.³ F04B *7/04, 39/10*
U.S. Cl. 417—490 **5 Claims**



1. In an injection pump assembly for an internal combustion engine, said assembly including a pump housing having at least one mounting bore extending thereinto from a housing surface thereof, and a respective injection barrel located at a mounted position in each said mounting bore for housing a respective pumping piston in one end thereof and a respective valve

means in the other end thereof, each said injection barrel including a first annular seat formed in the external periphery of a first portion thereof and a respective first annular seal being positioned in said first seat, said first annular seal normally projecting radially outward beyond the external periphery of the injection barrel axially adjacent to said first seat when uncompressed, said first annular seal being compressed by radial engagement with the wall of said mounting bore when said injection barrel is in said mounted position in said bore, the improvement wherein:

said injection barrel further includes a second annular seat formed in the external periphery of a second portion thereof and a respective second annular seal being positioned in said second seat, said second portion of said injection barrel being axially inward of said first portion and said second seat being axially spaced inwardly from said first seat, said second annular seal also normally projecting radially outward beyond the external periphery of said barrel axially adjacent to said second seat when uncompressed and also being compressed by radial engagement with the wall of said bore when in said mounted position;

said mounting bore includes first and second chamfered surfaces formed in the wall thereof at axially-spaced locations therealong, said first and said second chamfered surfaces each having respective diameters sufficiently small for said engagement with said respective first and second annular seals when said injection barrel is at said mounted position, the diameter of said bore between said second chamfered surface and said housing surface and including said first chamfered surface, being always greater than the diameter of said second annular seal when uncompressed thereby to prevent shaving said second annular seal during axial displacement of said injection barrel into or out of its said mounted position; and

wherein the included angle of each of said first and said second chamfered surfaces relative to the axis of said bore is relatively small to allow axial adjustment of said mounted position of said injection barrel.

4,488,858

COMPRESSOR WITH RADIAL INLET TO SCREW-FORMED ROTOR

Rune V. Glanvall, Norrkoping, Sweden, assignor to Stal Refrigeration AB, Norrkoping, Sweden

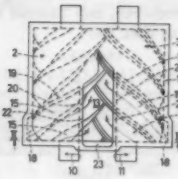
Filed Aug. 30, 1982, Ser. No. 413,247

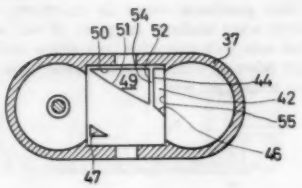
Claims priority, application Sweden, Sep. 15, 1981, 8105471

Int. Cl.³ F04C *18/14*

U.S. Cl. 418—195 **7 Claims**

1. A compressor of the rotary type including a housing, at least two rotors mounted in the housing for rotation about respective axes, a first of said rotors having a plurality of crests with intermediate grooves extending substantially in screw-line form and parallel to each other around the first rotor, a second of said rotors having protruding means adapted to enter said grooves in a meshing zone of the housing, said protruding means being operable to form one end of suction chambers in respective grooves for sucking in a medium to be compressed, the housing having an inlet port for supplying said medium to the suction chambers, said inlet port being located radially outside said first rotor and provided with confining edges located close to said crests, said edges having a first part positioned to cut off communication of the suction chambers with the inlet port upon rotation of the rotors, the compressor also including the improvement in which said inlet port is located adjacent said meshing zone, said edges of the port having a second part adjoining said first part and extending substantially parallel to the axis of said first rotor over a plurality of said suction chambers in the grooves of the first rotor, said medium upon rotation of the rotors being sucked into the suction chambers under said second part of said edges, said inlet port having an area substantially equal to the sum of the cross-sectional





areas of the grooves into which the medium is sucked in under said second part of said edges.

4,488,859

APPARATUS FOR MANUFACTURING POWDER BY DIVIDING A MELT

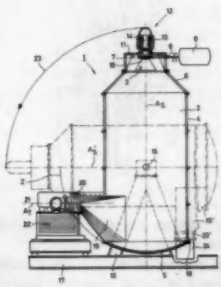
Rolf Ruthardt, Hanau am Main, Fed. Rep. of Germany, assignor to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Jun. 9, 1983, Ser. No. 502,497

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1982, 3233742

Int. Cl.³ B28B *1/54*

U.S. Cl. 425—6 **5 Claims**



1. Apparatus for manufacturing powder by dividing a melt into particles and then cooling the particles until they harden, comprising: means for dividing the melt; a container comprising a vertical shaft with a vertical axis for cooling the particles; powder discharge means communicating with the shaft through a substantially funnel-shaped housing with a longitudinal axis that is substantially perpendicular to the direction in which the powder flows under gravity prior to the shaft being tilted, said longitudinal axis being substantially parallel to the direction in which the powder flows after said shaft is tilted; said longitudinal axis of the funnel-shaped housing being positioned substantially perpendicular to said shaft; said shaft being mounted for tilting in a bearing; said axis of the funnel being

brought into a substantially vertical position by tilting said shaft.

4,488,860

METHOD AND APPARATUS FOR PRODUCING MULTI-LAYER EXPANDED FILMS

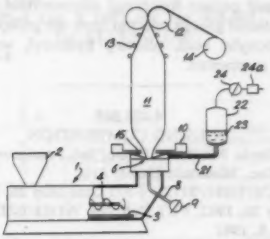
Stephen H. Joseph, London; John E. Miller, Leigh-on-Sea, and Lawrie A. Williamson, Colchester, all of England, assignors to National Research Development Corporation, London, England

Division of Ser. No. 276,252, Jun. 22, 1981, Pat. No. 4,383,968. This application Feb. 1, 1983, Ser. No. 462,922

Claims priority, application United Kingdom, Jun. 20, 1980, 8020314

Int. Cl.³ A21C 3/00

U.S. Cl. 425—131.1 **10 Claims**



1. Apparatus for forming multi-layer film comprising

an extrusion die defining an extrusion axis and presenting a die mouth;

means including said extrusion die for forming a base film comprising at least one extruded layer, said die mouth having a width dimension determining the thickness of said extruded layer upon leaving said extrusion die;

a manifold;

a metering orifice surrounding said extrusion axis;

means to propel fluid through said manifold and said metering orifice in succession to meet a surface of said base film at a first location closely downstream of said extrusion die before any substantial degree of expansion has taken place and so to coat a further layer upon it, said metering orifice including a defining structure presenting a surface region at which said fluid leaves contact with said defining structure in the course of forming said coating further layer;

said surface region being at a second location separated from said die mouth by a first linear dimension, measured parallel to said extrusion axis, that is not substantially greater than said width dimension with a space being provided substantially immediately downstream of said second location and without any solid restraining structure, in which said resulting multi-layer film is free to expand; and

means subsequently to expand said resulting multi-layer film.

4,488,861

BLOWING HEAD FOR MAKING A SYNTHETIC-RESIN TUBE

Hans Reifenhäuser, Troisdorf, Fed. Rep. of Germany, assignor to Reifenhäuser GmbH & Co. Maschinenfabrik, Troisdorf, Fed. Rep. of Germany

Filed Mar. 29, 1983, Ser. No. 479,950

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1982, 3211833

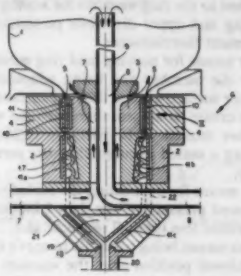
Int. Cl.³ B29F 3/08

U.S. Cl. 425—379 R **11 Claims**

1. An apparatus for forming a thin-wall and flattenable synthetic-resin tube, the apparatus comprising:

inner and outer nozzle parts generally centered on a common axis and defining an annular passage centered on the axis, the parts being formed with respective annular, independent, and substantially closed chambers juxtaposed with the passage and extending axially therealong, one of the chambers being radially inside the passage and the other chamber being axially level with the inner chamber and radially outside the passage;

means for feeding a hot plastic mass under pressure to one end of the passage, whereby the mass passes axially along



the passage to emerge from the other end thereof as a tube; and

respective independent bodies of liquid partially filling the chambers, the liquid being vaporizable generally at the temperature of the hot mass in the passage, whereby the liquid is vaporized at hot spots of the passage and the vapor thus produced condenses in cool spots of the passage.

4,488,862

COMPRESSION MOLDING APPARATUS HAVING VACUUM CHAMBER

Joseph N. Epel, Southfield, and Robert E. Wilkinson, Birmingham, both of Mich.; Horst F. Mach, Toledo, Ohio, assignors to The Budd Company, Troy, Mich.

Filed Apr. 25, 1983, Ser. No. 488,494

Int. Cl.³ B29G 2/02, 1/00

U.S. Cl. 425—405 R **4 Claims**

1. Apparatus for compression molding a part from a charge having a curable resin therein, said apparatus comprising:

upper and lower die members defining a mold cavity therebetween generally corresponding to the shape of the desired part when the dies are closed;

press means for moving the die members relative to each other, said press means being operative to move the die members to an open position where the die members are spaced apart a sufficient distance to permit the charge to be placed on the lower mold, said press means being further operative to move the die members to a partially closed position where the mold cavity is essentially defined, but the upper die remains spaced from the charge, and said press means being subsequently operative to move the die members to a fully closed position where the upper die member contacts the charge causing it to spread and fill the cavity;

a fixed member providing a first horizontally extending

surface, said fixed member surrounding the lower die and connected thereto in a fluid-tight manner;

a vertically movable ring member surrounding, yet spaced from, the upper die, which provides a second horizontal surface aligned with the first horizontal surface;

a resilient seal on one of the first or second horizontal surfaces;

flexible diaphragm means having an inner edge rigidly attached to the upper die and an outer periphery rigidly attached to the ring member for sealing the space between the ring and upper die while permitting relative vertical movement therebetween;

cylinder means for moving said ring member relative to the upper die member and being adapted to press the ring member surface against the first surface of the fixed member to create an air seal therebetween when the die members are moved to be partially closed position thereby defining a sealed vacuum chamber surrounding the mold cavity;

vacuum means for evacuating the sealed vacuum chamber to a reduced pressure of less than 7 inches of mercury absolute within less than 20 seconds; and

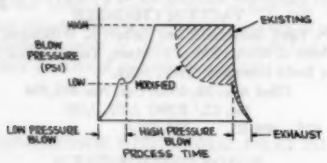
said press means being operable to move the upper die to the fully closed position after the vacuum chamber has been evacuated whereby the resin in the mold cavity can spread and cure to form the finished part.

4,488,863

RECYCLING OF BLOW AIR

Wayne N. Collette, Canton, Conn., assignor to The Continental Group, Inc., Stamford, Conn.

Filed Feb. 23, 1981, Ser. No. 236,959
Int. Cl.³ B29C *17/07*
U.S. Cl. 425—530 **4 Claims**



1. In combination with a system for blowing articles in two different pressure stages, a blowing gas supply system, said blowing gas supply system comprising a high pressure gas supply and a separate low pressure gas supply, piping leading to a blow molding apparatus, first valve means coupling said low pressure gas supply to said piping for delivering low pressure blowing gas to said piping, second valve means connecting said high pressure gas supply to said piping for delivering high pressure blowing gas to said piping, and third valve means connecting said low pressure gas supply to said piping for returning high pressure gas from said piping to said low pressure gas supply for reclaiming high pressure blowing gas for use as said low pressure blowing gas.

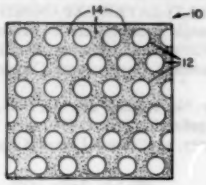
4,488,864

INTEGRAL OPTICAL DEVICE AND METHOD OF MAKING IT

Nicholas F. Borrelli, Elmira; Thomas H. Elmer, Corning; David L. Morse, Corning, and Paul A. Sachenik, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Aug. 4, 1983, Ser. No. 520,457
Int. Cl.³ G03C *1/68*
U.S. Cl. 430—13 **19 Claims**

1. An integral optical device composed of a porous glass body having an optical pattern in a zone of said body surrounded by a porous glass matrix, said optical pattern comprising a photolyzed organometallic compound in the pores of said zone, said organometallic compound being selected from the group consisting of transition metal carbonyl, metal alkyl, and metal-aryl, characterized in that said patterned zone is filled with a substantially polymerized organo functional silicone



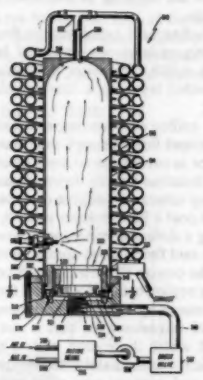
fluid, and said porous glass matrix is filled with an essentially unpolymerized organo functional silicone fluid, said silicone having functional groups selected from the group consisting of amine, carboxylic acid, primary hydroxyl, secondary hydroxyl, and mercaptan.

4,488,865

PULSING COMBUSTION

Robert E. Davis, Mountain Home, Ark., assignor to Arkansas Patents, Inc., Mountain Home, Ark.

PCT No. PCT/US81/01727, § 371 Date May 26, 1982, § 102(e) Date May 26, 1982, PCT Pub. No. WO82/02278, PCT Pub. Date Jul. 8, 1982
PCT Filed Dec. 22, 1981, Ser. No. 403,769
Int. Cl.³ F23C *11/04*
U.S. Cl. 431—1 **17 Claims**



1. A pulsing combustion device comprising:

means for defining an elongate combustion chamber having an inlet for a combustible mixture and an unvalved outlet for combustion gases;

a floating poppet valve member mounted in reciprocation relation in a wall of said combustion chamber, said poppet valve member having a first side in communication with said combustion chamber and a second side in communication with a supply of a combustible mixture and having at least one port through said valve member, said reciprocation of said poppet valve member in said wall closing and opening communication through said at least one port between said combustion chamber and said supply of combustible mixture, said floating poppet valve member having means for directing said combustible mixture along the sides of said combustion chamber;

means for supplying a pressurized combustible mixture to said second side of said poppet valve member, said supply

means having substantially smaller cross section area than said second side of said poppet valve member;

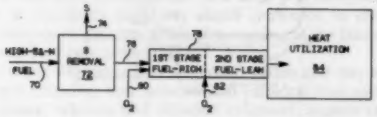
means for combusting said combustible mixture in said combustion chamber to produce pressurized combustion gases, said poppet valve member being reciprocated by said pressurized combustible mixture in communication with said second side and said pressurized combustion gases in communication with said first side to regulate the flow of said combustible mixture into said combustion chamber.

4,488,866

METHOD AND APPARATUS FOR BURNING HIGH NITROGEN-HIGH SULFUR FUELS

Robert M. Schirmer, Bartlesville, Okla., and Henry E. Alquist, Savannah, Ga., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 3, 1982, Ser. No. 404,682
Int. Cl.³ F23J 5/00
U.S. Cl. 431—4 **33 Claims**



1. A method for minimizing the production of SO_x and NO_x in the burning of a primary fuel containing significant amounts of SO_x and NO_x precursors, comprising:

(a) burning an auxiliary fuel in the presence of a combustion supporting material, sufficient to supply oxygen in an amount greater than the stoichiometric amount necessary to burn all of said auxiliary fuel, and for a residence time sufficient to produce significant amounts of hydrogen and abruptly terminating said step of burning said auxiliary fuel, before significant amounts of other products are formed from the thus produced hydrogen, to produce an auxiliary fuel effluent containing significant amounts of hydrogen;

(b) contacting said primary fuel with said auxiliary effluent in a hydrodesulfurization step, under conditions sufficient to remove significant amounts of SO_x precursors from said primary fuel but insufficient to remove significant amounts of said NO_x precursors from said primary fuel, to produce a primary fuel containing significant amounts of NO_x precursors and reduced amounts of SO_x precursors;

(c) carrying out fuel-rich combustion by burning the thus hydrodesulfurized primary fuel in a combustion zone in the presence of a combustion supporting material, sufficient to supply oxygen in an amount less than the stoichiometric amount necessary to burn all of said primary fuel, and for a residence time sufficient to convert a major portion of said NO_x precursors to N_2, to produce an effluent containing significant amounts of N_2 and unburned and partially burned fuel;

(d) abruptly terminating said fuel-rich combustion and initiating fuel-lean combustion; and

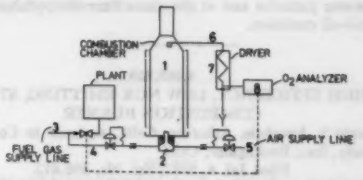
(e) carrying out fuel-lean combustion of said effluent containing significant amounts of unburned and partially burned fuel by burning said effluent in the presence of an additional amount of combustion supporting material, sufficient to supply oxygen in an amount sufficient to provide an overall amount of oxygen at least as great as the stoichiometric amount necessary to burn all of said primary fuel, and for a residence time sufficient to essentially complete the combustion of said primary fuel, to produce a flue gas predominating in N_2 and CO_2 and containing substantially reduced amounts of SO_x and NO_x.

4,488,867

METHOD FOR CONTROLLING THE HEAT LOAD OF A PLANT FED WITH NATURAL GAS OF VARIABLE CALORIFIC VALUE AND DENSITY

Giovanni Beltrami, San Donato Milanese, and Fulvio Formics, Sanzenone al Lambro, both of Italy, assignors to SNAM S.p.A., Milan, Italy

Filed Jun. 18, 1981, Ser. No. 275,024
Claims priority, application Italy, Jul. 4, 1980, 23240 A/80
Int. Cl.³ F23N 1/00
U.S. Cl. 431—12 **2 Claims**



1. In a method for controlling the heat load of a plant fed with natural gas by adjusting the volumetric through put of the feed gas in the main line connected to the plant relative to its caloric content,

withdrawing a small portion of the natural gas from the main line,

combining air with the withdrawn gas in an amount such that the air/gas ratio will insure that there will be no unburnt products in the withdrawn gas after being burnt,

feeding the withdrawn natural gas-air mixture into a combustion chamber separate from the plant and burning the natural gas-air mixture in the chamber,

withdrawing the combustion products from the chamber,

measuring the oxygen content of the combustion products to determine the Wobbe index of the natural gas to provide a measure of the caloric content of the natural gas, and

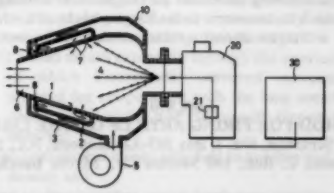
varying the volumetric through put of the natural gas in the main line downstream from where it was withdrawn in response to said determination to maintain the caloric content of the natural gas and thereby maintain the heat load in the plant at a set value.

4,488,868

APPARATUS AND METHOD FOR THE COMBUSTION OF WATER-IN-OIL EMULSION FUELS

Akeo Tanaka, No. 565, Tobori, Himeji-shi, Hyogo, Japan

Continuation of Ser. No. 376,048, May 7, 1982, abandoned. This application Apr. 17, 1984, Ser. No. 604,122
Claims priority, application Japan, May 15, 1981, 56-72200
Int. Cl.³ F23D 11/44
U.S. Cl. 431—243 **3 Claims**



1. An apparatus for a burner for the combustion of a water-oil emulsion having at least a water content of about 40 percent comprising an inner vessel having an imperforate large diameter substantially cylindrical portion, an inwardly tapered rear portion having imperforate side walls and a reduced diameter end opening adapted to be secured to the outlet of an oil burner

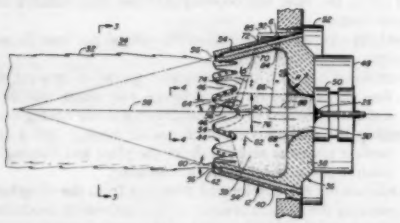
and a frusto-conical front portion having a reduced diameter opening, an outer vessel surrounding said inner vessel in spaced relation and secured thereto at opposite ends to define a secondary air preheating chamber, a plurality of holes formed in said frusto-conical front end portion of said inner vessel for communicating said preheating chamber with the interior of said vessel, baffle means secured to said inner vessel intermediate said inner and outer vessels in overlying relation to said holes and air supply means for supplying compressed air to said preheating chamber whereby the compressed air will be introduced into the interior of said inner vessel through said holes for compressing the flame of the water-oil emulsion emanating from said burner and forcing said flame to swirl and remain in said inner vessel thereby causing the micro-explosion of water particles and at the same time the pyrolysis of the water-oil emulsion.

4,488,869

HIGH EFFICIENCY, LOW NOX EMITTING, STAGED COMBUSTION BURNER

Temple S. Voorheis, Atherton, Calif., assignor to Coen Company, Inc., Burlingame, Calif.

Filed Jul. 6, 1982, Ser. No. 395,412
Int. Cl.³ F23D *15/02*
U.S. Cl. 431—352 **39 Claims**



1. A burner basket for use with a low NOX, high efficiency fuel burner, the basket comprising: a base defining a longitudinal basket axis and including a burner throat of a sufficient size to permit the introduction of the fuel and an off-stoichiometric amount of primary combustion air, a tubular wall extending generally transversely away from the base in surrounding relation to the throat, a free-end of the wall defining an outlet for the basket, a plurality of heat radiating cut-outs in the wall at least a portion of which extends upstream from the basket outlet to permit heat from a flame in the basket to radiate substantially perpendicular to a longitudinal axis of the basket to heat transfer surfaces surrounding the basket when installed in a furnace, and a multiplicity of secondary combustion air conduits terminating proximate the basket outlet for discharging streams of secondary combustion air into a section of the flame formed by the fuel and disposed downstream of the basket outlet, wherein the conduits are oriented so that secondary air streams issuing therefrom are tangential to an imaginary cylinder which is concentric to the longitudinal axis so that the secondary airstreams impart a rotary motion to the section of the flame.

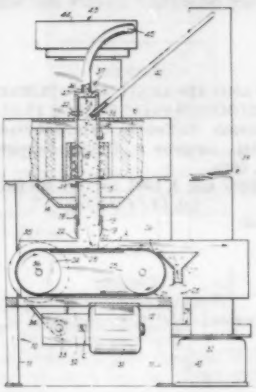
4,488,870

METHOD FOR FIRING ARTICLE OR THE LIKE

Dehart G. Scrantom, Rte. 1, Box 307-A2, Shallotte, N.C. 28459, and Truman C. Rutt, 106 Morton Cir., Myrtle Beach, S.C. 29577

Division of Ser. No. 262,033, May 8, 1981, Pat. No. 4,445,851. This application Nov. 7, 1983, Ser. No. 548,923
Int. Cl.³ F27D *3/00, 17/00*
U.S. Cl. 432—11 **1 Claim**

1. A method for the continuous manufacture of sintered ceramic articles such as monolithic ceramic capacitors which comprises the steps of continuously and progressively introducing green ceramic articles and pulverulent material in predetermined proportion into a vertically arrayed heating zone at an upper end of said zone to define a vertical column of said articles and material, positioning below the lowermost end of said column a horizontal stop plate having a porous screen disposed adjacent the upper surface of said plate, the spacing between said screen and the lower end of said column being greater than the smallest dimension of said ceramic articles, the



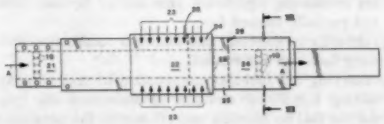
pores of said screen being smaller than the smallest dimension of said articles and larger than said pulverulent material, causing said column to traverse said zone at a selected rate by progressively shifting said screen horizontally to remove increments of said column above said screen, and thereafter causing said removed increments on said screen to be subjected to a separation step whereby said articles are segregated from said pulverulent material.

4,488,871

PROCESS FOR PRODUCING UNEVEN COLORING EFFECTS ON FIRING PLATE-LIKE CERAMIC MATERIAL

Gottfried Cremer, Cologne, Fed. Rep. of Germany, assignor to Buchtal GmbH, Fed. Rep. of Germany

PCT No. PCT/DE82/00028, § 371 Date Sep. 17, 1982, § 102(e) Date Sep. 17, 1982, PCT Pub. No. WO82/03072, PCT Pub. Date Sep. 16, 1982
PCT Filed Feb. 11, 1982, Ser. No. 425,098
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1981, 3108325
Int. Cl.³ F27D *7/00*; F27B *9/04, 3/22, 5/04*
U.S. Cl. 432—19 **20 Claims**



1. A process for producing uneven coloring on plate-like ceramic products in a kiln having heating, firing and cooling zones including the steps of transporting the products through the kiln in a flat, single layer; firing the products in the firing zone; screening off a portion of the kiln where the products are at firing temperature; pulsatingly injecting a reactive gas into the screened-off portion while transporting the products therethrough, whereby said gas reacts with the products creating a

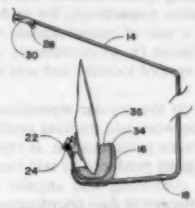
variety of coloring effects on the products due to variation in the concentration of the gas in the screened-off portion.

4,488,872

ORTHODONTIC LINGUAL FACE BOW

Vincent M. Kelly, 4550 S. Harvard, Tulsa, Okla. 74135

Filed Jan. 23, 1984, Ser. No. 572,759
Int. Cl.³ A61C 7/00
U.S. Cl. 433—5 **4 Claims**



1. A lingual orthodontic face bow lever arm comprising:

(a) an essentially rigid tray means contoured to rest and pivot on at least one tooth, thus serving as the fulcrum of said face bow lever arm;

(b) a first wire lever arm embedded within said tray means and extending both intraoral and extraoral from said tray means, wherein said intraoral extension consists of said first wire extending essentially parallel to the backside of the tooth and terminating with a hook means that fits between a tooth and lingual archwire attached to the teeth and wherein said extraoral extension consists of said first wire extending outwardly and upwardly terminating in a fastener means adapted to engage to a high pull headgear that applies torque through said first wire lever arm to the lingual archwire; and

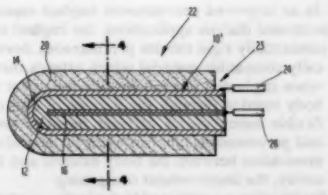
(c) a second wire lever arm embedded within said tray means and extending both intraoral and extraoral from said tray means, wherein said intraoral extension consists of said second wire extending essentially parallel to the backside of the tooth and terminating with a hook means that fits between a tooth and lingual archwire attached to the teeth and wherein said extraoral extension consists of said second wire extending outwardly and upwardly terminating in a fastener means adapted to engage to a high pull headgear that applies torque through said second wire lever arm to the lingual archwire.

4,488,873

PIEZOELECTRIC POLYMERIC FILM OCCLUSAL FORCE INDICATOR

Philip E. Bloomfield, Bala Cynwyd, Pa., and Harry Shpuntoff, Jackson Heights, N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Jun. 14, 1983, Ser. No. 504,203
Int. Cl.³ A61C 9/00
U.S. Cl. 433—71 **13 Claims**



1. Occlusal force indicating device comprising polymer film means having a metallized coating on each face thereof to form a piezoelectric film assembly,

a plastically deformable material coating in substantial contact with outer faces and edges of said piezofilm assembly, said piezofilm assembly comprising a single film folded upon itself to form a folded piezofilm assembly, and

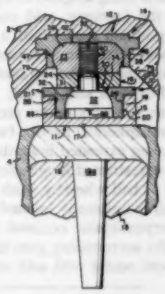
electrical means connected to said piezofilm assembly for conducting electrical output generated thereby to form said occlusal force indicating device, said electrical means comprising a shielded cable with a center lead connected to central metallized coatings and shielding connected to outermost layers of said metallized coatings, said output being generated when occlusal force is applied to said plastically deformable material.

4,488,874

DETACHABLE MOUNTING FOR A DENTAL FIXTURE AND METHOD FOR USING SAME

Jack Soifer, 287 Park Ave., Rochester, N.Y. 14607

Continuation-in-part of Ser. No. 373,264, Apr. 29, 1982, abandoned. This application Sep. 27, 1983, Ser. No. 536,191
Int. Cl.³ A61C 8/00
U.S. Cl. 433—173 **21 Claims**



1. An attachment means for use in attaching a dental prosthesis to a tooth, comprising:

(a) cooperating male and female portions wherein the male portion includes a base, the female portion includes a head, and the base and the head are adapted for attachment to and between the dental prosthesis and the tooth;

(b) post assembly means including,

(i) a base member having means for attachment to the base of the male portion, and an essentially centrally disposed aperture extending therethrough;

(ii) a stud means extending through the aperture, one end of which incorporates universal movement means adapted for cooperation with the base member, to enable rotation of the stud means with respect to the base member;

(iii) engagement means attached to another end of the stud means; and

(iv) resilient washer means having an aperture extending therethrough, surrounding the stud means and separating the base member from the engagement means; and

(c) retention means operatively associated with the head of the female portion and adapted to receive the engagement means of the stud means releasably to retain the male portion to the female portion.

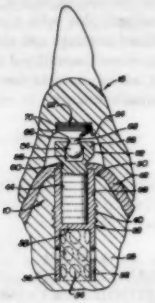
4,488,875
CONNECTOR FOR OVERDENTURE

Gerald A. Niznick, Encino, Calif., assignor to A&L Investment Company, Encino, Calif.

Division of Ser. No. 372,945, Apr. 29, 1982, Pat. No. 4,431,416. This application Oct. 7, 1983, Ser. No. 540,124

Int. Cl.³ A61C *8/00*

U.S. Cl. 433—173 **2 Claims**



1. A removable dental prosthesis fitted to seat upon the gum tissue of a subject, the combination therewith of:

(a) a two part attachment for stabilizing said prosthesis in the mouth of the user;

(b) one of said parts being adapted to be anchored directly or indirectly to the jawbone, said one part providing an accessible snap-in ball socket with a restricted opening;

(c) the other of said parts being a substantially spherical part or ball adapted to be attached to said prosthesis to project therefrom and to enter said socket;

(d) said prosthesis having a recess providing clearance entirely about said spherical part or ball;

(e) said socket being extended inwardly to provide a space for relatively unrestricted longitudinal movement of said spherical part or ball whereby, with said prosthesis fitted so that the ball is nominally located just inwardly of the restriction, perpendicular occlusal forces are sustained primarily by the surrounding gum tissue without contact of said prosthesis recess with said one of said parts.

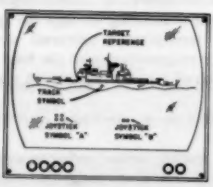
4,488,876
AIMPOINT PROCESSOR FOR QUANTIZING TARGET DATA

Daniel L. Thomas, Manchester, and John J. Poetker, Clarksville, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 26, 1982, Ser. No. 362,350

Int. Cl.³ F41G *3/26*

U.S. Cl. 434—20 **9 Claims**



1. Apparatus for quantizing target tracking data from a stored video representation of a dynamic target tracking operation scenario wherein the target being tracked is depicted with a tracking symbol superimposed thereon indicating the aimpoint for the target tracking system, said apparatus comprising in combination:

display means responsive to said stored video representation for displaying said target tracking scenario on a frame by frame basis,

means for demarcating on a frame by frame basis the respective locations of said tracking symbol and a preselected reference point on the target, said location demarcating means comprising means controllable by an operator to position independently first and second display symbols at said target tracking symbol location and said target reference point location respectively, for each display frame, and producing a pair of output signals representing respectively the linear (x, y) coordinates of each of said target tracking symbol location and said target reference point location,

means responsive to the angular separation on said video representation between said tracking symbol location and said target reference point location, as represented by the pair of output signals produced by said location demarcating means, for converting said angular separation into linear (x, y) displacement data coordinates for each frame of said target tracking scenario, and

means for storing said linear (x, y) displacement data coordinates for each frame of said target tracking scenario.

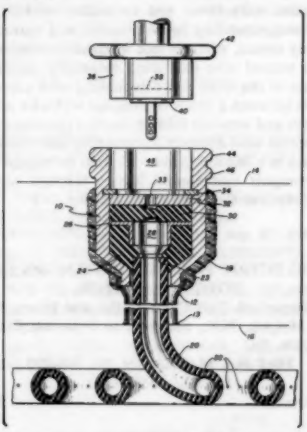
4,488,877
PERCUTANEOUS IMPLANT FOR PERITONEAL DIALYSIS

Elias Klein; Ronald L. Wathen; Richard A. Ward, all of Louisville, Ky.; Louis C. Cosentino, Wayzata, Minn.; Larry E. Fuller, Minnetonka, Minn., and Felix J. Martinez, Plymouth, Minn., assignors to Renal Systems, Inc., Minneapolis, Minn.

Filed Aug. 23, 1982, Ser. No. 410,365

Int. Cl.³ A61F *1/00*; A61M *25/02*

U.S. Cl. 604—175 **8 Claims**



1. In an improved percutaneous implant especially suitable for peritoneal dialysis applications, the implant comprising:

a substantially rigid tubular percutaneous device of biologically compatible material which extends through the skin when implanted so as to provide means for accessing the body interior through the interior of said device, and a flexible subcutaneous catheter member associated with said percutaneous tubular device for providing fluid communication between the body exterior and the peritoneal cavity, the improvement comprising:

a flexible sleeve member of biologically compatible material surrounding said catheter for a portion of the length thereof from said percutaneous tubular device, the length of the sleeve being sufficient to pass through the tissue between said percu-

taneous device and through the peritoneal wall, said sleeve including a free end affixable to the peritoneal wall around an opening therein and a fixed end connected to said rigid tubular percutaneous device so as to provide a conduit between said percutaneous tubular device and the peritoneum through which said catheter is carried into the peritoneum; and said catheter member being removably engaged within said percutaneous tubular device and said sleeve member so as to be removable and replaceable through said sleeve member after implantation.

4,488,878

PROCESS TO PRODUCE DURABLE PRESS LOW FORMALDEHYDE RELEASE CELLULOSIC TEXTILES

Bethlehem K. Andrews, and Robert M. Reinhardt, both of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 6, 1984, Ser. No. 586,618
Int. Cl.[3] D06M *13/40*
U.S. Cl. 8—187 12 Claims

1. A process for producing durable press low formaldehyde release cellulosic textiles comprising: reacting hydroxymethylated organic carbamates with water soluble alcohols to produce etherified hydroxymethylated carbamates and then treating a cellulosic textile with the etherified hydroxymethylated carbamates and an acid catalyst for sufficient time and at sufficient temperature to produce a durable press low formaldehyde release cellulosic textiles.

4,488,879

PROCESS FOR DYEING TEXTILE MATERIALS OF POLYACRYLONITRILE: QUATERNIZED PIPERAZINE COPOLYMER AS BASIC DYE RETARDER

Rolf Fikentscher, Ludwigshafen; Herbert Fleischer, Beindersheim; Sigismund Heimann, Ludwigshafen, and Heinrich Mertens, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 5, 1983, Ser. No. 510,564
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1982, 3225877
Int. Cl.[3] D06R *3/00*
U.S. Cl. 8—539 11 Claims

1. In a process for dyeing textiles of anionic polyacrylonitrile or copolymers containing acrylonitrile in polymerized form with basic dyestuffs in aqueous baths according to the exhaust method, employing retarders the improvement wherein said retarders are water soluble reaction products prepared by

(1) condensation of

(a) compounds selected from the group consisting of piperazine, bis-(1,4-aminopropyl)-piperazine, 1-aminoethylpiperazine, 1-methylpiperazine and mixtures thereof with

(b) compounds selected from the group consisting of ethylene chloride, epihalohydrin, propylene chloride, 1,3-dichloro-2-hydroxypropane, bis-epoxybutane, 1,4-dichlorobutane, and mixtures thereof

the mole ratio of (a):(b) being about 1:09 to 1:1.1 and

(2) quaternization of the condensation products with benzylchloride

(a) the amount of benzylchloride being about 0.8 to 1.5 moles per mole of component (a).

4,488,880

PROCESS FOR THE REOXIDATION OF DYEINGS MADE WITH SULFUR DYESTUFFS

Heinrich Bernhardt, Kriftel, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 29, 1984, Ser. No. 594,681
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1983, 3312162; Oct. 21, 1983, 3338267
Int. Cl.[3] C09B *49/00*; D06P *5/06, 1/30*
U.S. Cl. 8—652 11 Claims

1. A process for the reoxidation, from an alkaline medium, of sulfur dyestuffs which have previously been applied, in a reduced form, to a textile material containing cellulose fibers and have been fixed thereto, which comprises exposing the fiber material which has been treated with the dyestuffs to the oxidative action of an aqueous solution of N-halogenated organic sulfonamides of the general formula

in which R denotes an aryl radical, Hal represents a halogen atom, and X represents a hydrogen atom or an alkali metal atom at a temperature between 15° and 98° C. and at pH values within the range from 8 to 12.

4,488,881

COAL-AQUEOUS MIXTURES HAVING A PARTICULAR COAL PARTICLE SIZE DISTRIBUTION

Seymour Mark, Northampton, Pa., assignor to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 416,606, Sep. 10, 1982, , which is a continuation-in-part of Ser. No. 230,062, Jan. 29, 1981, Pat. No. 4,358,293. This application May 18, 1983, Ser. No. 495,627
Int. Cl.[3] C10L *1/32*
U.S. Cl. 44—51 15 Claims

1. A stabilized, high solids content coal-aqueous mixture comprising particulate coal as a dispersed solid material; water as a carrier medium; and a polyalkyleneoxide nonionic surfactant having a hydrophobic portion and a hydrophilic portion, said hydrophilic portion comprising at least about 100 units of ethylene oxide, wherein said particulate coal has the following particle size distribution:

mesh (Tyler Standard screen size)	% weight based on total dry coal
−60, +100	5–20
−100, +200	15–30
−200, +325	15–30
−325	30–50

4,488,882

METHOD OF EMBEDDING HARD CUTTING PARTICLES IN A SURFACE OF A CUTTING EDGE OF CUTTING TOOLS, PARTICULARLY SAW BLADES, DRILLS AND THE LIKE

Friedrich Dausinger, Steinenhausenstr. 18, D7000 Stuttgart; Werner Müller, Hermann-Essig-Str. 106, D-7141 Schwieberdingen; Eckart von Roda, Riegeläckerstr. 1, D-7250 Leonberg; Wilbert Reibetanz, Keltenstr. 5, D-7022 Leinfelden, and Otto Baumann, Weingartenstr. 24, D-7022 Leinfelden, all of Fed. Rep. of Germany

Filed Apr. 22, 1983, Ser. No. 487,809
Claims priority, application Fed. Rep. of Germany, May 3, 1982, 3216456
Int. Cl.[3] B24B *1/00*
U.S. Cl. 51—295 20 Claims

1. Method comprising, in accordance with the invention, the steps of

partially melting the surface region of the cutting edge of the tool by moving a beam of radiant energy relative to successive portions of the surface thereof;

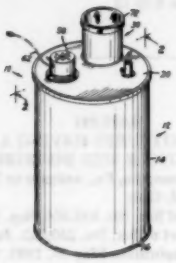
contacting the partially molten edge with abrasive cutting particles of at least 0.3 mm in diameter in granular form and partially embedding said particles in the molten edge;

and permitting said cutting edges, with sharp corner portions of said granular particles projecting by slightly differing distances therefrom, to solidify and harden.

4,488,883
VACUUM BAG CLEANING SYSTEM

Joseph T. Philp, 145 Gailmor Dr., Yonkers, N.Y. 10710

Filed Feb. 23, 1984, Ser. No. 582,920
Int. Cl.³ B01D *46/42*
U.S. Cl. 55—311 14 Claims



1. A vacuum bag cleaning system, comprising in combination:

a substantially rigid receptacle member having a bottom wall and a top rim,

a substantially horizontal top wall opposing said bottom wall removably and sealably secured to said top rim of said receptacle member, said top wall forming first and second apertures,

an elongated member forming a cylindrical chamber vertically extending through said first aperture, said elongated member having upper and lower portions respectively extending above and below said top wall, said chamber having opposed top and bottom openings at said upper and lower portions respectively, said bottom opening being spaced from said bottom wall of said receptacle member, said top opening being defined by a circular top opening rim, said member being sealably connected to said top wall at the juncture of said upper and lower portions, said chamber having a substantially vertical axis,

exhaust means cooperatively mounted at said second aperture and sealably secured to said top wall, said exhaust means being for drawing air from said compartment through said top opening of said chamber and exhausting said air into the atmosphere,

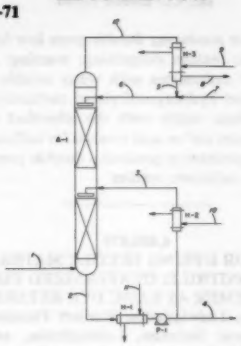
and

a bag member having a flexible cloth wall permeable to passage of air forming an elongated compartment having a length and having an open end and a closed end at opposed ends of said length, said open end being defined by a circular holding rim adapted to be removably and sealably placed around said top opening rim of said chamber in a mounted relationship, said cloth wall having normal inner and outer surfaces, said bag member being substantially circular in cross-section with a center substantially aligned with said vertical axis of said chamber, said bag member being movable in said mounted relationship to a plurality of selected positions in said chamber, wherein in each of said plurality of selected positions said flexible wall of said bag member forms a substantially horizontal toroidal ring around the circumferential portion of said bag member substantially centered on said vertical axis of said chamber, said toroidal ring having a toroidal wall portion disposed downwardly forming an upwardly disposed toroidal recess, whereby air being drawn into said top opening of by said chamber bag said exhaust means is concentratedly drawn through said toroidal wall portion at said plurality of selected positions.

4,488,884
PROCESS FOR THE PRODUCTION OF AQUEOUS HYDROCHLORIC ACID HAVING A CONCENTRATION OF AT LEAST 35.5% BY WEIGHT

Joseph V. Parigi, Baytown, Tex., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Oct. 19, 1983, Ser. No. 543,563
Int. Cl.³ B01D *47/00*
U.S. Cl. 55—71 4 Claims



1. A process for continuously producing aqueous hydrochloric acid having a concentration of at least 35.5% by weight comprising:

(a) continuously introducing water to the top of an absorption unit,

(b) continuously introducing a gas stream consisting essentially of 80–98% by volume anhydrous hydrogen chloride to the bottom of said absorption unit,

(c) removing an overhead gaseous stream from said unit, said gaseous stream containing no more than 3% by weight, hydrogen chloride,

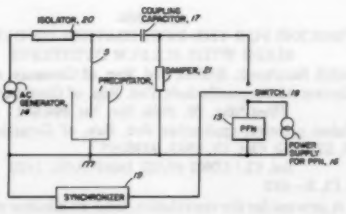
(d) removing a bottom liquid stream from said unit, said bottom stream containing at least 35.5% by weight hydrogen chloride, and

(e) returning a portion of said bottom stream to said unit, at a location above the point of introduction of the gas stream and below the point of introduction of the water.

4,488,885
ELECTROSTATIC CHARGING APPARATUS

Helmut I. Milde, Boxford, Mass., assignor to High Voltage Engineering Corporation, Burlington, Mass.

Filed Nov. 1, 1982, Ser. No. 438,327
Int. Cl.³ B03C *3/08, 3/38*
U.S. Cl. 55—139 2 Claims



1. Apparatus for charging gaseous particles, comprising a charging zone for passage of a gas therethrough along a first dimension, at least one corona electrode within said zone and at least one non-corona electrode within said zone, said electrodes positioned and arranged to define at least one pair

within said zone, the electrodes in each said at least one pair being so arranged that said gas flows therebetween, voltage-application means for applying a continuous ac voltage and a periodic unipolar pulsed voltage across each said at least one pair, said voltage-application means being so constructed that (a) said ac voltage is insufficient to produce by itself significant corona current, (b) the voltage of said pulse is high enough to produce the desired quantity of ions and low enough to avoid initiating breakdown, (c) the duration and repetition rate of said pulsed voltage is sufficiently great so that said ions are propagated towards said at least one non-corona electrode and fill the charging zone before leaving it, and (d) the spatial amplitude of the oscillating motion of said ions due to said ac voltage is much smaller than the dimensions of said charging zone transverse to said first dimension but greater than the displacement of said ions during propagation during each pulse of said pulsed voltage.

4,488,886

AMORPHOUS ARYL SUBSTITUTED POLYARYLENE OXIDE MEMBRANES

Anthony Zampini, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jun. 30, 1982, Ser. No. 509,624
Int. Cl.³ B01D *53/22*
U.S. Cl. 55—158 **7 Claims**

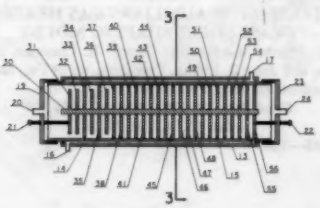
1. A hollow fiber asymmetric polymeric gas separation membrane comprising amorphous aryl substituted arylene oxide polymer, said polymer compatible for mixing with a polar solvent to form a hollow fiber forming solution of from 10 to 40 percent by weight of polymer wherein said solution is fiber forming when extruded into a coagulation solution of at least 80 percent by weight water.

4,488,887

COLD TRAP

Anthony L. Angel, Winston-Salem; James L. Harris, Westfield, and Michael F. Dube, Pfafftown, all of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Oct. 17, 1983, Ser. No. 542,267
Int. Cl.³ B01D *45/08, 50/00*
U.S. Cl. 55—269 **8 Claims**



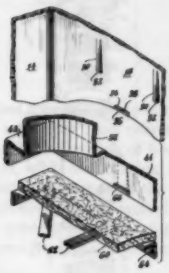
1. A cold trap for effecting removal of components from an aerosol stream which comprises:
- (a) an elongated vessel having side walls connecting an entrance end and an exit end,
- (b) end closures disposed at said entrance and exit ends in sealing engagement with said side walls with at least one of said end closures being removable,
- (c) inlet means for introducing the aerosol stream into the entrance end of said vessel,
- (d) outlet means for withdrawing from the exit end of said vessel a residual gaseous stream from which the aerosol has been removed,
- (e) means for subjecting a substantial portion of the side walls to temperatures below 0° C., and
- (f) a removable baffle assembly slidably positioned and extending longitudinally within said elongated vessel intermediate its entrance and exit ends with said assembly including a rod and a plurality of spaced baffle plates supported thereon, said baffle plates being constructed and arranged so as to provide a tortuous path to the flow of said aerosol stream through said vessel, wherein at least one of the baffle plates located adjacent the entrance end of said vessel is constructed and arranged to direct said aerosol stream toward said side walls.

4,488,888

TABLE TOP AIR FILTER

Edward J. Doyle, Hatboro, Pa., assignor to Conair Corporation, Edison, N.J.

Filed May 16, 1983, Ser. No. 495,037
Int. Cl.³ B01D *50/00*
U.S. Cl. 55—481 **7 Claims**



1. A readily assemblable table top air filter comprising:
- a unitary molded plastic housing having substantially vertical sides open at the bottom to provide an air inlet and a top with openings to provide an air outlet;
- inwardly extending integral stops on a plurality of said vertical sides spaced upwardly from the bottom of each of said sides;
- inwardly extending integral latch members on a plurality of said vertical sides spaced downwardly from said stops;
- a fan support assembly includes (a) a substantially horizontal base member secured within said housing between said stops and latch members, said base defining air passages therethrough, (b) a vertically oriented electric motor mounted on said base member, and (c) a fan driven by said motor;
- said vertical sides being sufficiently resilient to permit said base member to be inserted into said housing and past said latch members during assembly;
- replaceable filter means secured within said fan support assembly and below said fan.

4,488,889

AIR CLEANER TANK

Glenn G. McCarroll, c/o Alcolite Products Corporation, 319 Industrial Pkwy., Harbor Beach, Mich. 48441

Filed Mar. 7, 1983, Ser. No. 472,697
Int. Cl.³ B01D *46/02*
U.S. Cl. 55—502 **4 Claims**

1. An air cleaner tank assembly adapted to receive a replaceable air cleaner element, comprising:

a housing having a first open end and a second open end at opposite ends thereof, said housing having said air cleaner element disposed between said first and second open ends, said open ends each being large enough to permit insertion and removal of said air cleaner element therethrough;

first and second removable covers normally closing said first and second open ends, respectively, each of said covers having threaded formations for detachable connection to cooperating threaded formations on said first and second ends of said housing;

said first and second covers each having a radially outwardly extending circumferential flange, and said first and second ends of the housing having a complementary flange adapted to abut said respective cover flanges when said covers and housing have been fully secured;

first and second clamping rings adapted to engage, lock together and secure against relative rotation said complementary flanges at said first and second ends of said housing, respectively;

said first cover having first attaching means formed thereon

for receiving and attaching a first air duct, thereby to establish a first air flow path through said first cover and between the interior of said housing and said first air duct; and

a third opening formed in a side wall of said housing between said first and second open ends, attaching means formed on said housing at said third opening for receiving and attaching a second air duct, thereby to establish a second air flow path through said third opening and between the interior of said housing and said housing and said second air duct.

4,488,890

LOW TEMPERATURE SEPARATION OF GASEOUS MIXTURE FOR METHANOL SYNTHESIS

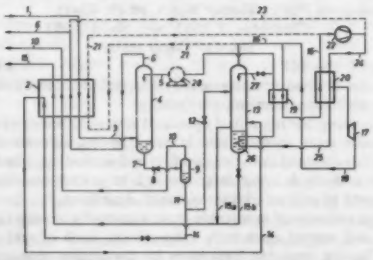
Wolfgang Foerg, Darien, Conn.; Walter Scholz, Wolfratshausen, and Freimut Marold, Neubiberg, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Dec. 23, 1983, Ser. No. 564,868

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1982, 3247782

Int. Cl.³ F25J *3/00*; B01D *47/00*

U.S. Cl. 62—17 **14 Claims**



1. A process for the separation of a gaseous mixture, containing essentially hydrogen, C_{1+}-hydrocarbons, and carbon monoxide, at low temperatures, into a gas depleted in C_{1+}-hydrocarbons and useful for further processing in methanol synthesis, said process comprising scrubbing the gaseous mixture with liquid CO in a scrubbing column to scrub out the C_{1+}-hydrocarbons to form a head product which contains essentially hydrogen and carbon monoxide; withdrawing the liquid CO, containing C_{1+}-hydrocarbons, as a sump product from the column, and passing said sump product into a C_{1+}-CO separating column to remove the CO as gaseous head product.

4,488,891

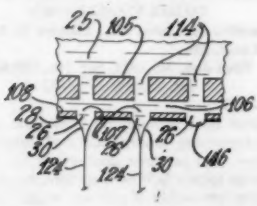
METHOD FOR FORMING GLASS FIBERS

Lawrence J. Grubka, Heath, and Clarence E. Fracker, Jr., Frazeysburg, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 11, 1983, Ser. No. 481,936

Int. Cl.³ C03B *37/085*

U.S. Cl. 65—2 **22 Claims**



22. In a method of making glass fibers wherein molten glass is supplied to the orifices of an orifice plate, the improvment of preventing bead drop during fiber attenuation by attenuating fibers from forming cones at the individual orifices while the molten glass at each orifice is at a pressure greater than the internal pressure of the respective cones and at a pressure less than the internal pressure of a bead formed at any orifice at which attenuation has been interrupted.

4,488,892

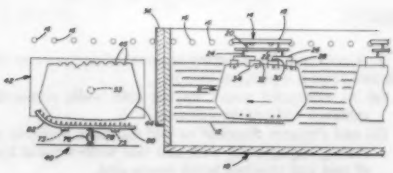
PIVOTAL SHAPED AUXILIARY GAS HEATER FOR GLASS SHEET SHAPING MOLDS

Robert G. Frank, Murrysville; George R. Claassen, New Kensington, and John J. Ewing, Tarentum, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 19, 1983, Ser. No. 459,084

Int. Cl.³ C03B *23/03*

U.S. Cl. 65—106 **4 Claims**



1. In a method of shaping a glass sheet having a curved lower edge while supported in a vertical or oblique position by heating the glass sheet to a temperature sufficient for shaping in a hot enclosed atmosphere, moving said sheet from said hot atmosphere into a shaping position between a pair of retracted press bending molds of complementary shape and directing burning gas to the lower edge portion of said glass sheet immediately before closing the space between said press bending molds, the improvement comprising directing said burning gas toward said curved lower edge from an apertured pipe means

serving as a burning gas source means arranged along a line approximating the shape of the lower edge of said glass sheet until the latter arrives at said shaping position in spaced relation between said press bending molds while said press bending molds are retracted, whereby said press bending molds are free from impingement by said burning gas when they are retracted, and simultaneously directing the burning gas away from said press bending molds as the space between said press bending molds is closed to engage the heat-softened glass sheet between said press bending molds, whereby said press bending molds continue to be free from impingement by said burning gas when they engage said glass sheet, wherein said glass sheet has a bottom edge provided with an upwardly turned end portion, further including moving said glass sheet with its upwardly turned end portion facing downstream and arranging said burning gas source means along a curved line having an upwardly turned downstream end portion, whereby said burning gas source means provides clearance for moving said glass sheet into said shaping position between said retracted press bending molds.

4,488,893

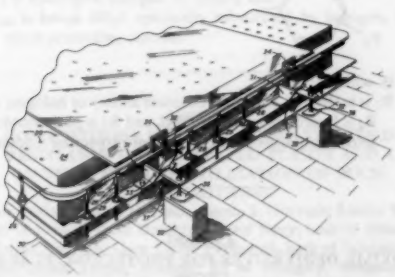
MOVABLE ALIGNMENT STOPS FOR GLASS SHEET SHAPING APPARATUS

George B. Claassen, New Kensington; Rudolph A. Karlo, Creighton, and William B. Zimmerman, Russellton, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 8, 1983, Ser. No. 521,478

Int. Cl.³ C03B *23/025*

U.S. Cl. 65—287 **7 Claims**



1. Apparatus for aligning and lifting a hot glass sheet at a shaping station comprising means defining a support surface for supporting said glass sheet thereon, a ring-like member, stop means associated with said ring-like member and means for raising and lowering said ring-like member relative to said means defining said support surface between a raised position above said support surface and a lowered position below said support surface, characterized by means mechanically responsive to movement of said ring-like member for mechanically moving said stop means into position near an end portion of said support surface to guide the positioning of an edge surface of said glass sheet thereagainst when said ring-like member occupies said lowered position and for mechanically moving said stop means into position recessed from said support surface when said ring-like member moves in the direction of the thickness of said supported glass sheet to said raised position to avoid edge damage when said ring-like member lifts said glass sheet from said support surface.

4,488,894

UNSYMMETRICAL AMINOSULFINAMIDE DERIVATIVES OF N-PHOSPHONOMETHYLGLYCINONITRILE, HERBICIDAL COMPOSITIONS AND USE

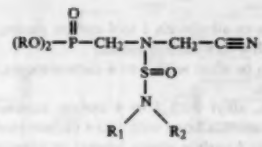
James A. Sikorski, Kirkwood, and Mary A. Hoobler, Olivette, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 21, 1984, Ser. No. 581,941

Int. Cl.³ A01N *57/22, 57/24;* C07F *9/40, 9/65*

U.S. Cl. 71—87 **33 Claims**

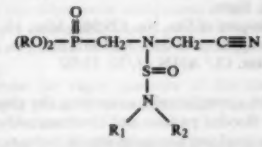
1. A compound represented by the formula



(I)

wherein R is selected from the group consisting of phenyl, or phenyl substituted with from 1 to 3 substituents independently selected from the group consisting of lower alkyl, lower alkoxy, trifluoromethyl, nitro and halogen; and wherein R_1 and R_2 are independently selected from the group consisting of alkyl, cycloalkyl, alkenyl, alkynyl, aralkyl and R; or R_1 and R_2 are independently selected from the aforerecited groups and joined together through nitrogen to form a cyclic structure having 4–8 atoms.

12. A herbicidal composition comprising an adjuvant and a herbicidally effective amount of a compound represented by the formula



(I)

wherein R is selected from the group consisting of phenyl, or phenyl substituted with from 1 to 3 substituents independently selected from the group consisting of lower alkyl, lower alkoxy, trifluoromethyl, nitro and halogen; and wherein R_1 and R_2 are independently selected from the group consisting of alkyl, cycloalkyl, alkenyl, alkynyl, aralkyl and R; or R_1 and R_2 are independently selected from the aforerecited groups and joined together through nitrogen to form a cyclic structure having 4–8 atoms.

4,488,895

N-DIAZOLYALKYL-HALOACETANILIDE COMPOUNDS AND HERBICIDAL COMPOSITIONS

Jörg Stetter; Klaus Ditgens, both of Wuppertal; Rudolf Thomas, Haan; Ludwig Eue, Leverkusen, and Robert R. Schmidt, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

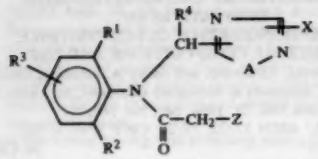
Division of Ser. No. 073,981, Sep. 10, 1979, Pat. No. 4,338,119. This application Jan. 28, 1982, Ser. No. 343,469

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1978, 2842284

Int. Cl.³ A01N *9/22;* C07D *285/08*

U.S. Cl. 71—90 **12 Claims**

1. N-Diazolylalkyl-haloacetanilide of the formula



(I)

wherein

A is sulphur,

R^1 is hydrogen or alkyl with 1 to 4 carbon atoms,

R^2 is alkyl with 1 to 4 carbon atoms,

R^3 is hydrogen or alkyl with 1 to 4 carbon atoms,

R^4 is hydrogen,

X is hydrogen, alkyl with 1 to 4 carbon atoms, fluorine, chlorine, bromine, alkoxy with 1 to 4 carbon atoms, alkylthio with 1 to 4 carbon atoms, phenyl or phenoxy and

Z is chlorine,

and in which the diazolyl radical is bonded via a carbon atom, and acid addition salts thereof.

9. Herbicidal composition comprising a herbicidally acceptable carrier and, in herbicidally effective amounts, an N-diazolylalkyl-haloacetanilide compound as claimed in claim **1**.

4,488,896

METHODS AND COMPOSITIONS FOR THE SELECTIVE CONTROL OF UNDESIRABLE WEED SPECIES IN THE PRESENCE OF WET-LAND CROPS

Glentworth Lamb, Lawrenceville, N.J., and Feliciano B. Calora, Makati, Philippines, assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 129,962, Mar. 13, 1980, abandoned. This application Jan. 26, 1981, Ser. No. 228,641

Int. Cl.³ A01N *43/50, 33/02*

U.S. Cl. 71—92 **3 Claims**

1. A method for synergistically enhancing the yield of rice from irrigated or flooded paddies and simultaneously controlling undesirable annual and perennial weeds in the presence of said rice crop comprising: applying to the locus in which said rice is grown, 0 to 2 days after drill seeding said locus with rice or 3 to 7 days after said crops are transplanted to the growing area, about 1.75 kg/hectare of N-(1-ethylpropyl)-2,6-dinitro-3,4-xylidine and about 0.50 kg/hectare of sodium-o-(5-isopropyl-5-methyl-4-oxo-2-imidazolin-2-yl)-benzoate.

4,488,897

DICHLOROMETHYL OXADIAZOLE HERBICIDE ANTIDOTES

Ronald J. Rusay, Lafayette, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

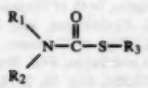
Filed Sep. 6, 1983, Ser. No. 529,804

Int. Cl.³ A01N *43/82;* **C07D** *87/38*

U.S. Cl. 71—92 **8 Claims**

1. An herbicidal composition comprising:

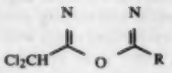
(a) an herbicidally effective amount of a thiocarbamate compound of the formula



in which

R_1, R_2 and R_3 are each independently alkyl having 1–6 carbon atoms, inclusive; and

(b) a non-phytotoxic antidotally effective amount of a compound of the formula



wherein R is unsubstituted phenyl or phenyl mono- or di-substituted with hydroxy or nitro.

4,488,898

OXIME DERIVATIVES FOR PROTECTING PLANT CROPS

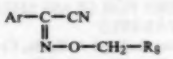
Werner Föry, Basel; Henry Martin, Allschwil, both of Switzerland, and Georg Pissiotas, Lörrach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 068,263, Aug. 20, 1979, Pat. No. 4,353,735. This application Jul. 14, 1982, Ser. No. 398,165

Int. Cl.³ A01N *43/38*

U.S. Cl. 71—96 **8 Claims**

1. A method of protecting sorghum and rice crops from the phytotoxic action of 1,3,5-triazine or haloacetanilide herbicides, which comprises adding to the herbicide or applying to the locus of the crops, as antidote, a compound of the formula



wherein

Ar is 1-naphthyl or

in which

R_1 is hydrogen, lower alkyl, lower alkoxy or halogen, and R_2 is hydrogen or lower alkyl, and R_8 is phthalimido or tetrahydrophthalimido, in a plant-protecting amount.

4,488,899

OXIME DERIVATIVES FOR PROTECTING PLANT CROPS

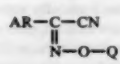
Werner Föry, Basel; Henry Martin, Allschwil, both of Switzerland, and Georg Pissiotas, Lörrach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 068,263, Aug. 20, 1979, Pat. No. 4,353,735. This application Jul. 14, 1982, Ser. No. 398,020

Int. Cl.³ A01N *37/34*

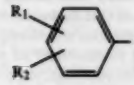
U.S. Cl. 71—105 **9 Claims**

1. A method of protecting sorghum, rice, soybean and wheat crops from the phytotoxic action of 1,3,5-triazine, haloacetanilide, or pyridyloxyphenoxyacetate or -propionate herbicides, which comprises adding to the herbicide or applying to the locus of the crops, as antidote, a compound of the formula



wherein

Ar is 1-naphthyl or



in which each of R_1 and R_2 is hydrogen, halogen, lower alkyl, lower alkoxy or nitro, and Q is halopropynyl,
in a plant-protecting amount.

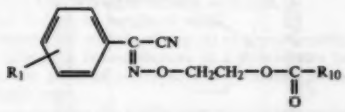
4,488,900

OXIME DERIVATIVES FOR PROTECTING PLANT CROPS

Werner Föry, Basel; Henry Martin, Allschwil, both of Switzerland, and Georg Pissiotas, Lörrach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 068,263, Aug. 20, 1979, Pat. No. 4,353,735. This application Jul. 14, 1982, Ser. No. 398,173
Int. Cl.³ A01N *37/34*
U.S. Cl. 71—105 **9 Claims**

1. A method of protecting sorghum, rice and maize crops from the phytotoxic action of 1,3,5-triazine, haloacetanilide or phenoxyphenoxy-acetate or -propionate herbicides, which comprises adding to the herbicide or applying to the locus of the crops, as antidote, a compound of the formula



wherein
R_1 is hydrogen, halogen or cyano, and
R_{10} is lower alkyl optionally substituted by halogen, in a plant-protecting amount.

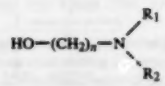
4,488,901

COMPOSITIONS FOR INCREASING THE COLD RESISTANCE OF CULTIVATED PLANTS AND A METHOD FOR THE UTILIZATION OF SUCH COMPOSITIONS

Tibor Farkas; Ibolya Horvath; Laszlo I. Horvath; Laszlo Vigh, all of Szeged; Zsolt Dombay; Jozsef Nagy, both of Miskolc; Emilia Nagy née Gera; Csaba Pavliscsak, both of Sajobabony, and Gyula Tarpai, Miskolc, all of Hungary, assignors to Északmagyarországi Vegyimüvek, Gyártelep, Hungary

Filed Dec. 17, 1981, Ser. No. 331,921
Claims priority, application Hungary, Dec. 18, 1980, 3036/80
Int. Cl.³ A01N *33/02*
U.S. Cl. 71—121 **9 Claims**

1. A method for increasing the cold resistance of a cultivated plant, which comprises the step of treating the cultivated plant before a temperature drop with an aqueous solution of a composition containing as active ingredient 0.001 to 5.000% by weight of at least one compound of the formula I



(I)

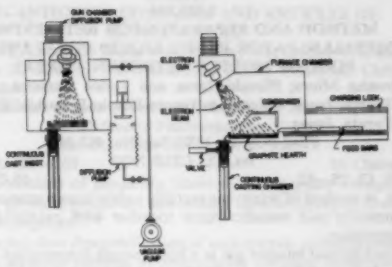
wherein n is an integer of 2 to 5 and R_1 and R_2 each stand for hydrogen or an N,N,N-trimethyl-quaternary ammonium salt thereof.

4,488,902

HORIZONTAL, MULTISTAGE ELECTRON BEAM REFINEMENT OF METALS WITH RECYCLE

Charles D'A. Hunt, Occidental, Calif., assignor to Duval Corporation, Houston, Tex.

Filed Jun. 10, 1983, Ser. No. 503,377
Int. Cl.³ C22B *4/00*
U.S. Cl. 75—10 R **16 Claims**



1. A multistage method of refining a metal containing at least two metallic components in at least two sequential metal vaporization stages substantially horizontally arranged and each having a metal feed thereto, comprising,
in each stage, irradiating the metal feed with an electron beam effective to heat the metal to a temperature at which the total vapor pressure of the melt is about 0.5 to 7 torr, and at which the partial vapor pressure of at least one metal component of the melt is different from that of at least one other metal component of the melt, and forming a vapor phase and a melt phase, in which each phase is either enriched or depleted in at least one metal component;
wherein the vapor pressure of the condensate of said vapor phase at its condensation point is less than about 10^{-3} torr;
and wherein the effective operating pressure of each stage is maintained at a low level compatible with electron beam irradiation;
passing the melt phase of each stage downstream to form at least part of the feed of the next stage; and
recycling the vapor phase of at least one stage upstream to at least one preceding stage to form at least part of the feed thereto;
wherein all vapor phases passing between stages are condensed in the stage from which they originate to form a corresponding liquid phase which is fed to a receiving stage via transport means wherein said phase remains liquid throughout its passage in and between stages.

4,488,903

RAPID DECARBURIZATION STEELMAKING PROCESS

Stewart K. Mehlman, Tarrytown, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 14, 1984, Ser. No. 589,469
Int. Cl.³ C21C *5/34*
U.S. Cl. 75—52 **27 Claims**

1. A process for the production of steel wherein a steel melt undergoes rapid decarburization to an aim carbon content comprising:
(A) providing a molten metal bath having a carbon content of at least 1.0 weight percent;
(B) injecting oxygen and powdered lime into said bath from above the surface thereof while simultaneously injecting oxygen and inert gas into the melt from below the melt surface, the amount of top injected oxygen being from 0.5 to 3 times the amount of bottom injected oxygen, to decar-

burize the melt until the melt has a carbon content of at least 0.1 weight percent, but not more than 0.5 weight percent, greater than the aim carbon content;

(C) thereafter discontinuing the top injection of oxygen and powdered lime; and

(D) injecting oxygen and inert gas into the melt exclusively from below the melt surface to decarburize the melt until the aim carbon content is attained.

4,488,904

METHOD AND APPARATUS FOR RETRIEVING METALLIC VAPOR IN THE LIQUID PHASE USING POOL OF MOLTEN RETRIEVING METAL

Hirohisa Miura; Hiroshi Satou, and Toshio Natsume, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 10, 1983, Ser. No. 493,243
Int. Cl.³ C22B 7/00
U.S. Cl. 75—62 **10 Claims**

1. A method of retrieving metallic vapor from a mixture gas containing said metallic vapor together with oxidizing gas, comprising:

leading said mixture gas at a high enough temperature and a low enough pressure to substantially prevent any oxidization reaction between the metallic vapor and the oxidizing gas from taking place, into a convergent-divergent nozzle having an upstream end, into which said gas is lead, and a downstream end, and

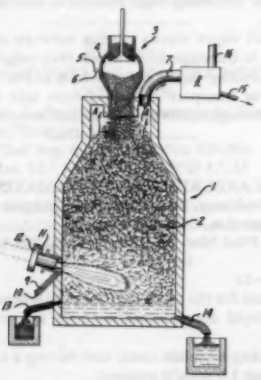
directing the resulting jet of mixture gas from the downstream end of the convergent-divergent nozzle, which jet of mixture gas has been cooled rapidly by adiabatic expansion in said convergent-divergent nozzle to a low enough temperature to substantially prevent the occurrence of any oxidization reaction between the metallic vapor and the oxidizing gas, directly to the surface of a pool of molten retrieving metal.

4,488,905

METHOD OF RECOVERING VOLATILE METALS FROM MATERIAL CONTAINING METAL OXIDES

Sven Santen, Hofors, Sweden, assignor to SKF Steel Engineering Aktiebolag, Sweden

Continuation of Ser. No. 200,152, Oct. 24, 1980, abandoned. This application Sep. 16, 1983, Ser. No. 533,203
Claims priority, application Sweden, Jun. 10, 1980, 8004312
Int. Cl.³ C22B 5/02
U.S. Cl. 75—89 **9 Claims**



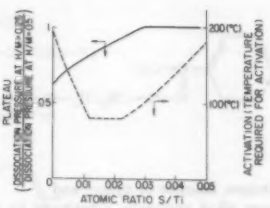
1. A method of reducing and recovering volatile metal from metal oxides in a shaft reactor having a top portion and a lower portion comprising the steps of injecting a material containing the oxide of a volatile metal into the lower portion of a shaft reactor, simultaneously injecting reducing agent into said lower portion of the reactor, continuously maintaining said reactor substantially filled with coke such that said coke forms a permeable stack through which the gaseous reaction products may pass, said coke stack catching substantially all particles of said material passing upwardly therethrough, supplying thermal energy to the reactor by means of an electric arc such that at least some of the metal oxides are reduced to metal and volatilized, permitting the volatilized metal to flow upwardly through the shaft reactor in the form of metal vapor together with a gas flow, maintaining the coke in the shaft reactor through which the volatized metal passes at a temperature in excess of 1000° C., screening the upper portion of the shaft reactor and the reactor top by means of the coke so as to prevent condensation of the volatilized metal, and withdrawing the volatilized metal from the top portion of the shaft.

4,488,906

HYDROGEN STORAGE METAL MATERIAL

Hisashi Gondo; Ryutaro Matsumoto; Jiro Ohno, and Ryoichi Suzuki, all of Kawasaki, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Oct. 14, 1983, Ser. No. 542,197
Claims priority, application Japan, Oct. 15, 1982, 57-179896
Int. Cl.³ C22C 38/28, 32/00
U.S. Cl. 75—123 M **6 Claims**



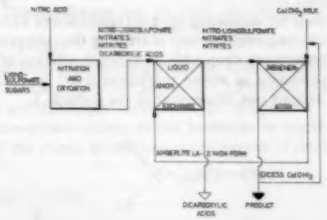
1. A hydrogen storage alloy selected from the group consisting of a TiFe alloy and a TiFeMn alloy, said alloy containing S in an atomic ratio of 0.004–0.04 based on the Ti in said alloy.

4,488,907

PROCESS FOR THE PREPARATION OF LIGNOSULFONATE-BASED MIXTURES USED IN PARTICULAR AS ADDITIVES OF CONCRETE

Veli Sarkkinen, Pori, Finland, assignor to Flowcon Oy, Toijala, Finland

Filed Oct. 4, 1983, Ser. No. 538,909
Claims priority, application Finland, Oct. 8, 1982, 823441
Int. Cl.³ C07G 1/00; C04B 9/02
U.S. Cl. 106—14.11 **6 Claims**



1. A Process for the preparation of sugar-free lignosulfonate-based mixtures as additives for the liquefaction of concrete, for accelerating the setting of concrete, and for inhibiting corro-

sion of concrete reinforcement steels contained in concrete from sulfite spent liquor which contains lignosulfonate and sugars derived from the hydrolyzation of cellulose comprising treating the sulfite spent liquor with a nitrating reagent selected from the group consisting of nitric acid and nitrogen dioxide, whereby nitrolignosulfonates and nitrite compounds are formed, and separating only the sugars and the organic carboxylic acids formed out of the sugars in connection with the nitration from the reaction mixture, whereby the nitrated and partly oxydated and desulfonated lignosulfonate compounds and any unreacted nitrating reagent as well as the nitrite compounds form the additive for concrete.

4,488,908

PROCESS FOR PREPARING A LIGHTWEIGHT EXPANDED SILICATE AGGREGATE FROM RICE HULL ASH

John D. Goodwin, Shreveport, and Forrest W. Mulkey, III, Plain Dealing, both of La., assignors to Molly Maguire, Inc., Shreveport, La.

Filed Jan. 24, 1983, Ser. No. 460,679
Int. Cl.³ C04B *31/00*
U.S. Cl. 106—75 **11 Claims**

1. A process for making a lightweight expanded silicate aggregate, which comprises the steps of:

(a) mixing

(i) 45–70% by weight of dry rice hull ash having a carbon content of less than about 4% by weight of the dry rice hull ash;

(ii) 10–25% by weight of an alkali metal hydroxide;

(iii) 2–4% by weight of boric acid; and,

(iv) 10–25% be weight of water;

(b) heating the mixture of step (a) to approximately 160° F.;

(c) curing the heated mixture at a temperature below the boiling point of water until the mixture forms a solid friable mass;

(d) comminuting the friable mass into discrete particles; and,

(e) expanding the comminuted particles by rapid heating to form the expanded silicate aggregate.

4,488,909

NON-EXPANSIVE, RAPID SETTING CEMENT

Richard E. Galer, Hanover Park, and Paul C. Webb, Lake Villa, both of Ill., assignors to United States Gypsum Company, Chicago, Ill.

Filed Nov. 25, 1983, Ser. No. 555,136
Int. Cl.³ C04B *7/35*
U.S. Cl. 106—89 **9 Claims**

1. A non-expansive, ettringite-producing hydraulic cement which produces a cementitious product which is resistant to carbon dioxide attack, is stable at high temperatures and has a high early strength, said hydraulic cement comprising from about 72% to about 80% portland cement, from about 14% to about 21% high alumina cement, from about 3.5% to about 10% calcium sulfate and from about 0.4% to about 0.7% hydrated lime, by weight.

4,488,910

ADMIXTURE FOR NONPLASTIC CEMENT MIXES AND METHOD

Richard R. Nicholson, Lyndhurst; Sally L. Vista, Euclid, and Reynold A. Berkey, Painesville, all of Ohio, assignors to Martin Marietta Corporation, Bethesda, Md.

Filed Nov. 16, 1983, Ser. No. 552,528
Int. Cl.³ C04B *7/35, 7/352*
U.S. Cl. 106—90 **18 Claims**

1. A method for increasing the strength of nonplastic hydraulic cement mixes comprising incorporating into a hydraulic cement mix an admixture comprising: an alpha olefin sulfonate; an alkylolamide; an alkanolamine; and glucose or its oligomers through a degree of polymerization characterized by commercial corn syrup, wherein the olefin sulfonate is incorporated into said cement mix at about 0.005 to about 0.5% by weight of cement, and said alkylolamide is incorporated into said cement mix at about 0.005 to 0.5% by weight of cement, and said and said alkanolamine is incorporated into said cement mix at about 0.01 to 0.1% by weight of cement, and said glucose and glucose oligomers are incorporated into said cement mix at about 0.01 to 0.02% by weight of cement.

4,488,911

NON-ANTIGENIC COLLAGEN AND ARTICLES OF MANUFACTURE

Edward E. Luck, 216 Robin Way, Menlo Park, Calif. 94025, and John R. Daniels, 842 Las Casas, Pacific Palisades, Calif. 90272

Continuation-in-part of Ser. No. 144,705, Apr. 28, 1980, now Defensive Publication No.
Int. Cl.³ C08L *89/06*; C07G *7/00*
U.S. Cl. 106—161 **14 Claims**

1. A method of preparing fibers of atelopeptide collagen having physical properties resembling natural collagen fibers which comprises:

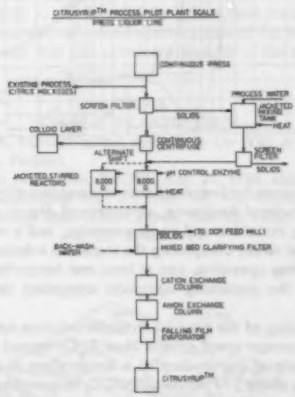
inducing slow desolubilization of atelopeptide collagen from an aqueous solution of atelopeptide collagen while subjecting said solution to a directionally uniform mild shear force of about 30 to about 5000 dynes/cm^2 whereby fibers of atelopeptide collagen are formed.

4,488,912

PREPARATION OF HIGH FRUCTOSE SYRUPS FROM CITRUS RESIDUES

Robert A. Milch, Baltimore; Patricia Guerry-Kopecko, Rockville; Carol Koeble-Smith, Germantown, and Edward M. Sybert, Ellicott City, all of Md., assignors to IGI Biotechnology, Inc., Md.

Filed Aug. 4, 1982, Ser. No. 405,037
Int. Cl.³ C13K *1/00*; C13B *1/00*; C11G *9/02*; C12P *19/02*
U.S. Cl. 127—41 **12 Claims**



1. A process for recovering a plurality of useful products from a citrus press liquor line from which a citrus press cake and screenable solids have been removed, which process comprises:

(A) centrifuging the screen filtered press liquor to form (i) 1 to 5 percent by volume of an upper colloid phase consisting essentially of limonene-containing biocidally active materials from said press liquor, (ii) a middle aqueous phase which is substantially free of said biocidally active materials and consists essentially of the dissolved sugars and soluble polymeric carbohydrates from said press

liquor, and (iii) a solid phase consisting essentially of citrus fragments and shards from said press liquor;

(B) separating the colloid phase (i) from the aqueous phase (ii) and the solid phase (iii) and recovering the biocidally active materials from the separated colloid phase;

(C) separating the solid phase from the aqueous phase;

(D) extracting fructose, glucose, and sucrose from the separated citrus fragments and shards of the solid phase by suspending the separated solid phase in a volume of water at 65–85 degrees C. roughly corresponding to the original volume of said centrifuged press liquor for about 10 to 15 minutes;

(E) separating the water-insoluble material of the solid phase from step (C) and combining it with a press cake from which citrus press liquor has been separated to increase the solids content thereof by at least 10 percent on a dry weight basis; and

(F) combining the separated aqueous extract from step (D) with the aqueous phase from step (C) to increase the hexose content of said aqueous phase by at least 20 percent by volume.

4,488,913

METHOD FOR INTERRUPTED HARDENING OF ALUMINUM-BASE ALLOYS

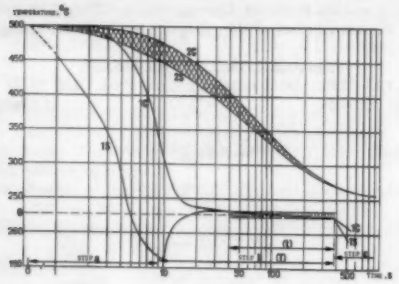
Daniel Ferton, Grenoble, France, assignor to Societe de Vente de l'Aluminium Pechiney, Paris, France

Filed Nov. 2, 1981, Ser. No. 317,399

Claims priority, application France, Nov. 5, 1980, 80 23944

Int. Cl.³ C22F *1/04*

U.S. Cl. 148—12.7 A **13 Claims**



1. A process for heat treatment of aluminum alloy product to effect structural hardening, an improved degree of resistance to flaking corrosion and stress corrosion, and a reduced level of internal stress, comprising the steps of a solution annealing, a quenching operation, and at least one tempering operation, wherein the quenching operation comprises the sequential steps of:

(a) cooling of the product from the solution temperature at an average speed greater than 3° C./second to bring the surface of the product to a temperature in the range of from about 150° to about 260° C. in a cooling medium or with a cooling agent, the temperature of which cooling medium or agent is lower than a temperature (θ) defined in step (b);

(b) interrupting cooling so as to allow the surface temperature of the product to increase and to establish a substantially uniform surface to core temperature (θ) of the product, which is in the range of from about 150° to about 260° C., for a duration of interruption (t) ranging from a few seconds to some tens of minutes; and

(c) resuming cooling of the product to bring the product to ambient temperature which resumption of cooling is at an average speed of greater than 60° C./minute, during cooling between the temperature (θ) attained in step (b) and

4,488,914

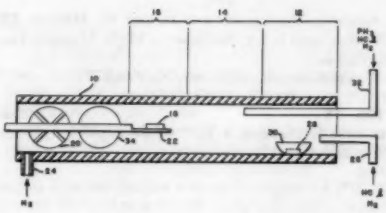
PROCESS FOR THE EPITAXIAL DEPOSITION OF III-V COMPOUNDS UTILIZING A CONTINUOUS IN-SITU HYDROGEN CHLORIDE ETCH

Kenneth P. Quinlan, Newton, and Thomas E. Erstfeld, Bedford, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 29, 1982, Ser. No. 437,655

Int. Cl.³ H01L *21/205, 21/322*

U.S. Cl. 148—175 **5 Claims**



1. A method for preparing and depositing an epitaxial film consisting essentially of indium phosphide onto the surface of a suitable substrate crystallographically compatible with said film, said method consisting essentially of the steps of:

(A) positioning a substrate suitable for epitaxial growth of indium phosphide on the surface thereof in a first deposition zone located at one end of a quartz reaction chamber while maintaining said first deposition zone at a predetermined temperature;

(B) positioning a source material consisting essentially of indium in a second source zone located at the other end of said quartz chamber while maintaining said second source zone at a predetermined temperature;

(C) introducing a gaseous mixture consisting essentially of (a) a first hydrogen chloride gas and (b) a hydrogen carrier gas into said second source zone and passing said gaseous mixture over said indium source to produce a first gaseous reactant consisting essentially of indium chloride;

(D) introducing said first gaseous indium chloride reactant into a third mixing zone of said quartz chamber, said third mixing zone being maintained at a predetermined temperature and positioned intermediate said first deposition and said second source zones;

(E) introducing a second gaseous reactant into said third mixing zone simultaneously with the entry of said first gaseous reactant into said third mixing zone, said second gaseous reactant comprising a mixture of (a) phosphine and (b) a hydrogen carrier gas to form a gaseous mixture consisting essentially of indium chloride, phosphine and hydrogen;

(F) continously introducing a flow of a second hydrogen chloride gas into said third mixing zone to form a gaseous admixture consisting essentially of (a) said second hydrogen cloride gas and (b) said gaseous mixture of indium chloride, phosphine and hydrogen and subsequently introducing said formed gaseous admixture into said heated first deposition zone to contact said substrate and affect the deposition of an indium phosphide, epitaxial, crystalline film thereon.

4,488,915

SINGLE-CRYSTAL CASTINGS

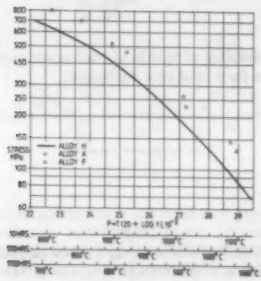
Anthony D. Hill, Brislington; David A. Ford, Yatton; Michael J. Goulette, Mickleover, and Roger P. Arthey, Melbourne, all of England, assignors to Rolls-Royce Limited, London, England

Filed Sep. 8, 1982, Ser. No. 416,008

Claims priority, application United Kingdom, Sep. 11, 1981, 8127455

Int. Cl.³ C22C *19/05*

U.S. Cl. 148—404 **4 Claims**



1. A single crystal casting made of a nickel-based alloy which has been heat treated at between about 1,250° C. and the melting point of the alloy for between about 1 and 5 hours and subsequent aging for at least 16 hours at a temperature of about 870° C., said single crystal casting consisting essentially of, by weight percent,

chromium: 7–13%
aluminium: 5–7%
titanium: 2–5%
cobalt: 4–16%
molybdenum and/or ruthenium: 1–4%
vanadium: 0–2%
carbon: 0–0.05%

balance nickel plus incidental impurities, the density of the alloy being less than 7.9 kg/dm³.

4,488,916

CAST EXPLOSIVE CHARGE COMPOSITION

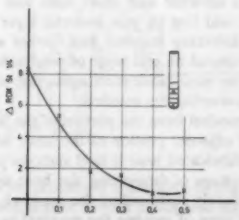
Paul Wanninger, Adelsberg, and Ernst Kleinschmidt, Schrobenhausen, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Fed. Rep. of Germany

Filed Sep. 20, 1983, Ser. No. 534,130

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1982, 3234978

Int. Cl.³ C06B *45/00*

U.S. Cl. 149—2 **5 Claims**



1. A cast explosive charge composition, consisting essentially of trinitrotoluene (TNT) forming a fusible component, at least one further energy carrier comprising a solid filler, and a finely pulverized inert solid substance which is present in an amount of from 0.01 to 0.1% by weight, said inert solid substance having a specific surface of from 10 to 1200 m² per gram.

4,488,917

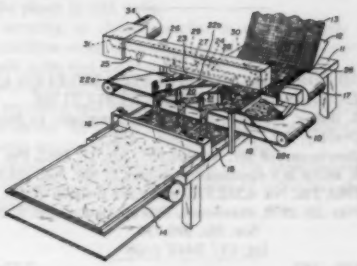
METHOD FOR MAKING CEMENT BOARD

Michael J. Porter, and Richard E. Galer, both of Hanover Park, Ill., assignors to United States Gypsum Company, Chicago, Ill.

Filed Jul. 25, 1983, Ser. No. 516,916

Int. Cl.³ B32B *31/12*

U.S. Cl. 156—39 **3 Claims**



2. In the continuous production of building board which comprises depositing an aggregate-filled cementitious material on a continuous, moving substrate and conveying the mound of material under a screed to form a continuous ribbon thereof; the improvement which comprises setting in motion an endless distributor belt mounted above the substrate in transverse relation thereto, shuttling a plurality of spaced-apart, successively wider plows along the distributor belt, continuously mixing water with a hydraulic cement and an aggregate, depositing the resulting mortar on the distributor belt in confronting relation to the faces of the plows, and continuously deflecting a plurality of spaced-apart streams of the mortar off of the distributor belt and across the breadth of the substrate.

4,488,918

NON-SLIP PLASTIC FILM

Jarl-Erik Jofs, Vaasa, Finland, assignor to Oy Wilk & Hoglund AB, Vaasa, Finland

Continuation of Ser. No. 296,791, Aug. 27, 1981, abandoned. This application May 27, 1983, Ser. No. 498,788

Claims priority, application Canada, Apr. 21, 1981, 375869

Int. Cl.³ B32B *5/18*

U.S. Cl. 156—79 **19 Claims**

1. A method of making a film of plastic material with a non-slip surface having a coefficient of friction of at least 0.45 comprising the steps of:

extruding a first layer of plastic film having a predetermined capability to resist tearing and rupturing upon stretching; and

simultaneously coextruding therewith a second layer of

plastic material having a predetermined lesser capability to resist rupture on stretching than said first layer; and

coextruding said second layer so that said second layer is bonded, at least at a multiplicity of spots, to said first layer;

expanding and coextruded layers after extrusion so as to cause the rupture of said second layer into a random pattern of high, hard, sharp peaks and ridges;

said second layer being formed of a high elasticity thermoplastic material having a melt flow index in the plastic-elastic state at least as low as 1.0, and having a high density in the range of 0.920 to 0.960.

4,488,919

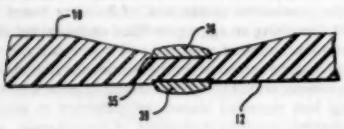
METHOD FOR MAKING SIMULATED BEVELED AND LEADED GLASS WINDOW STRUCTURE

Donald R. Butler, Newport Beach, Calif., assignor to Stained Glass Overlay, Inc., Mission Viejo, Calif.

Continuation-in-part of Ser. No. 386,987, Jun. 10, 1982, Pat. No. 4,438,165, which is a continuation-in-part of Ser. No. 158,919, Jun. 12, 1980, Pat. No. 4,335,170, which is a division of Ser. No. 962,123, Nov. 20, 1978, abandoned. This application Jul. 6, 1982, Ser. No. 395,734

Int. Cl.³ B44F *1/06*

U.S. Cl. 156—153 **7 Claims**



1. The method of preparing a simulated beveled and leaded glass window structure comprising:

a. forming a plurality of beveled grooves having flat beveled sidewalls with sharp edges and optical quality smoothness along the front face of a plate of substantially clear or translucent glass or plastic having a smooth front side and a smooth reverse side to subdivide said plate into design segments of unrelieved pane thickness surrounded by beveled grooves, and providing each groove with a sidewall angle from 10 to about 70 degrees and with a flat bottom wall having a width from 0.1 to about 0.6 inch; and

b. inserting a plurality of lead strips having a width about equal to the width of said flat bottom walls and flat undersurfaces into each of said grooves and bonding the flat undersurfaces of said lead strips to said flat bottom walls of said grooves, thereby enclosing said design segments with said lead strips.

4,488,920

PROCESS OF MAKING A CERAMIC HEAT EXCHANGER ELEMENT

Louis J. Danis, Battle Creek, Mich., assignor to Williams International Corporation, Walled Lake, Mich.

Filed May 18, 1982, Ser. No. 379,284

Int. Cl.³ B32B *31/12*

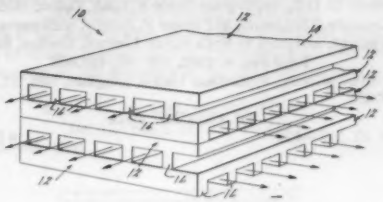
U.S. Cl. 156—155 **8 Claims**

1. A process for manufacturing a ceramic heat exchanger comprising the steps of

shaping a fugitive carbon form,

depositing a layer of ceramic material on said carbon form by chemical vapor deposition,

burning said carbon form away from said ceramic material to form a heat exchanger element, and



bonding a plurality of said heat exchanger elements to one another to form said heat exchanger.

4,488,921

METHOD FOR FABRICATING LONG LENGTH HOSE UTILIZING AN INTERNAL MOVING MANDREL

Robert C. Dougherty, Tucson, Ariz., assignor to Durodyne, Inc., Tucson, Ariz.

Filed Sep. 23, 1982, Ser. No. 421,914

Int. Cl.³ B31C *3/16*

U.S. Cl. 156—172 **8 Claims**

1. A method of intermittently fabricating long lengths of hose composed of an inner tube, at least a first layer of tie gum material, at least a first layer of reinforcing material, and hose covering material comprising the steps of:

forming an inner tube of hose material of a desired length;

inserting a mandrel substantially shorter than said inner tube into said inner tube so that the entire mandrel is covered by a portion of said inner tube;

advancing said inner tube and said mandrel while applying a first layer of tie gum material upon the portion of said inner tube covering the mandrel;

advancing said inner tube and said mandrel along with said tie gum material layer while encircling said first layer of tie gum material with a first layer of reinforcing material;

continuing to advance said inner tube and said mandrel along with said first tie gum material layer and said first layer of reinforcing material and further adding a hose covering material on said layer of reinforcing material to complete the hose fabrication upon the portion of said inner tube covering the mandrel;

moving the mandrel from the portion of the fabricated hose to the next adjacent portion of the inner tube while said portion of fabricated hose is held stationary;

repeating the steps of fabricating the hose upon the inner tube immediately surrounding the mandrel;

repeating the steps of moving the mandrel to the next portion of the inner tube and fabricating the hose upon the inner tube immediately surrounding the mandrel until the full length of the inner tube has received all the fabrication materials;

moving the mandrel out of the hose; and

vulcanizing the hose to cure the hose.

4,488,922

METHOD AND APPARATUS FOR PRODUCING LABELS

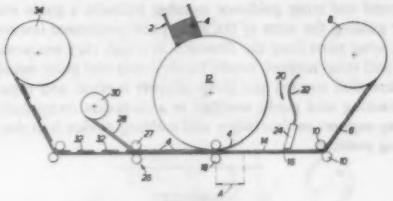
David J. Instance, Past Heap Farm, Pembury, Tunbridge Wells, Kent, England

Filed Jun. 22, 1983, Ser. No. 506,807

Claims priority, application United Kingdom, Jun. 25, 1982, 8218496

Int. Cl.³ B31C *13/00*

U.S. Cl. 156—192 5 Claims



1. A method of producing a succession of lithographically-printed self-adhesive labels on a length of release backing material, which method comprises the steps of:

(a) producing by lithographic printing a plurality of sheets carrying a desired image,

(b) adhering each of the lithographically-printed sheets successively to a support web comprising a self-adhesive backed material carried on a release material, the printed sheets being adhered to the upper surface of the adhesive backed material,

(c) cutting through the adhered lithographic sheets and through the adhesive-backed material as far as the release material thereby to form the required labels, and

(d) removing the unwanted portions of the printed sheets and the adhesive-backed material adhered thereto from the release material.

4,488,923

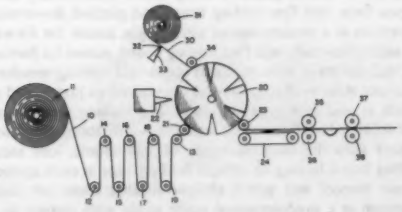
METHOD FOR PRODUCING A FABRIC HAVING UNSECURED ELASTIC IN AREAS INTERMITTENTLY DISPOSED ALONG AN EDGE THEREOF

Heinz A. Pieniak, North Brunswick, N.J., assignor to Personal Products Company, Milltown, N.J.

Continuation-in-part of Ser. No. 325,611, Nov. 27, 1981, abandoned. This application Jan. 13, 1984, Ser. No. 570,332

Int. Cl.³ B32B *31/08*

U.S. Cl. 156—199 9 Claims



7. A method for producing a plurality of individual disposable diapers, each diaper having elasticized legband portions disposed between opposing waistband portions comprising:

(a) feeding a web of substantially inelastic material along a first path;

(b) intermittently forshortening said web by moving said web out of the plane of said first path and then returning it to the plane of the first path;

(c)(i) moving a second continuous substantially inelastic web along a second path;

(ii) intermittently moving said second web out of the plane of said second path and substantially immediately returning it to the plane of said second path in a position adjacent to the position from which it has been removed to form a pleat and foreshorten the longitudinal length of said second layer;

(d) combining said second continuous substantially inelastic web with said first substantially inelastic web along the longitudinal edges such that the pleats coincide; and

(e) disposing a plurality of spaced absorbent panels between said webs, the central portion of said panels being adjacent the pleats in said webs;

(f) securing an elastic member in a substantially relaxed condition along each longitudinal edge of either or both of said webs that are in the plane of said first path while said web is in the foreshortened condition;

(g) returning said web to its original length in said first path whereby the elastic members between adjacent secured areas are stretched and unsecured; and

(h) severing said combined webs in the areas between adjacent panels to produce a plurality of individual disposable diapers.

4,488,924

METHOD OF SEALING LAMINAR THERMOPLASTIC FILMS AND BAGS

Donald J. Krieg, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 329,478, Dec. 10, 1981, Pat. No. 4,401,256. This application Mar. 24, 1983, Ser. No. 478,597

Int. Cl.³ B32B *31/18*

U.S. Cl. 156—251 3 Claims

1. A method of sealing a film laminate comprising:

(a) forming a laminate comprising a first layer comprising a major amount of a high density polyolefin, a minor amount of an adhesion promoting ionomer and a heat seal promoting proportion of a metal salt of a fatty acid; and a second layer adhering to said first layer, said second layer comprising a polyamide;

(b) placing one or more regions of said first layer in face to face contact; and

(c) applying sufficient temperature to said regions to fuse said regions together.

4,488,925

SERVO MOTOR CONTROLLED LABELER

Alan J. Craig, Afton, and Thomas F. Look, Anoka, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 11, 1983, Ser. No. 474,546

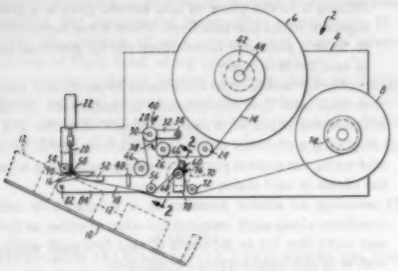
Int. Cl.³ B32B *31/00*; G05G *15/00*; B65H *25/00, 25/22*

U.S. Cl. 156—351 8 Claims

1. In a labeling mechanism for dispensing and applying labels from a label stock including label tape and a liner to a moving item and including a supply reel around which is convolutely wound a supply of the label stock, a servo motor driven capstan engaging the liner to advance the label stock from the reel and toward the item and an edge disposed between the reel and the capstan and adapted to cause the label to be separated from the liner, the improvement comprising:

a one-way clutch and bearing assembly connected to said servo motor which permits movement of said liner from said supply reel and prevents movement of said liner

toward said supply reel by allowing rotation of said servo motor in one direction only so that a reverse polarity



voltage may be applied to said servo motor without causing movement of said liner toward said supply reel.

4,488,926

APPARATUS FOR SECURING A SYNTHETIC THERMOPLASTIC STRAP IN A BAND-LIKE FORM AROUND AN OBJECT

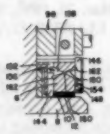
Manfred Rauch, Achern, Fed. Rep. of Germany, and Wenzel Synek, Hofraim, Switzerland, assignors to Fromm AG, Spreitenbach, Switzerland

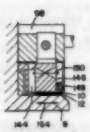
Filed Sep. 10, 1982, Ser. No. 416,553

Claims priority, application Switzerland, Sep. 22, 1981, 100/81

Int. Cl.³ B32B *31/00*; B31F *5/00*; B65H *19/00, 69/02*

U.S. Cl. 156—379.8 **10 Claims**





1. Apparatus for securing a synthetic thermosplastic strap in a band-like form around an object comprising a strap support including a strap support surface extending between a first end and a second end of said support and said strap support being arranged to afford access in the direction extending transversely of the first end-second end direction to said strap support surface for placing overlapping strap parts extending in the first end-second end direction on said strap support surface so that the strap parts can be secured together, a clamping device positioned above said band support surface adjacent the first end thereof and arranged to hold the strap parts on said strap support surface, a stretching device located above said strap support surface between said clamping device and the second end of said band support and arranged to stretch and tension the strap parts, a welding device including a swinging jaw located between said stretching device and the second end of said strap support and positioned above the strap support surface, said welding device arranged to cooperate with said strap support in welding the strap parts together, said swinging jaw is pivotally mounted above an axis extending in the first end-second end direction so that said swinging jaw pivots in a path extending transversely of the first end-second end direction between an operating position and an open position, said welding device includes a release device for holding said swinging jaw in the open position, a first strap guidance member located adjacent the first end of said strap support and a second strap guidance member located adjacent to the second end of said strap support for guiding the strap parts, and said second end strap guidance member includes a guide member for guiding the sides of the strap parts positioned inwardly of the strap parts from the direction in which they are positioned on said strap support, means for directing said guide member in a direction toward said strap support surface, and means for retracting said guide member in a direction away from said strap support surface when said welding device is in the operating position.

4,488,927

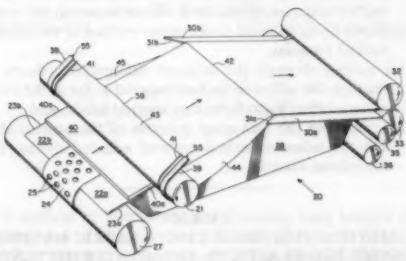
APPARATUS FOR C-FOLDING A COVERING WEB ABOUT A LONGITUDINALLY FLEXIBLE ARTICLE

Leonard C. Hooper, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 16, 1983, Ser. No. 494,842

Int. Cl.³ B31F *1/00*

U.S. Cl. 156—464 **7 Claims**

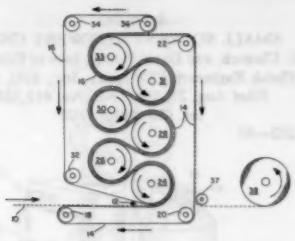


1. An apparatus for longitudinally C-folding a running length of a flexible covering web about a longitudinally flexible article and for adhesively securing longitudinal edge portions of said flexible covering web to juxtaposed longitudinal edge regions of the bottom surface of said article, said apparatus comprising a transverse turning member, a first planar folding board having an upstream end disposed subjacent said turning member, a second planar folding board immediately downstream from said first folding board and pitched downwardly therefrom at a predetermined pitch angle, means for forwarding said article onto said first folding board, means for forwarding said covering web onto and about said turning member in a flat-out state so that its central span becomes juxtaposed said article as said article passes under said turning member, said first folding board having a nominal width about equal to or greater than the nominal width of said article, said second folding board having an oblique folding edge at each upstream corner thereof and which oblique folding edges are canted upstream at a predetermined acute angle with respect to the longitudinal center line of said second folding board, means for forwarding said article and said covering web together through said apparatus so that the longitudinal edge portions of said covering web are folded under the longitudinal edge regions of the bottom surface of said article and become juxtaposed therewith only upon passing over said oblique folding edges, said predetermined pitch angle being so related to said predetermined acute angle that all portions of said covering web traverse the same distance.

4,488,928
METHOD AND APPARATUS FOR FORMING SOFT, BULKY ABSORBENT WEBS AND RESULTING PRODUCT

Mir I. Ali Khan, and Richard J. Schmidt, both of Appleton, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed May 16, 1983, Ser. No. 495,225
Int. Cl.³ B32B 31/00
U.S. Cl. 156—495 5 Claims

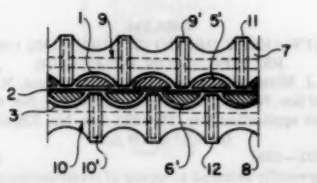


1. Apparatus for bonding webs containing low melt thermoplastic fibers comprising:
(a) a first flexible, foraminous traveling wire having a % open area in the range of from about 20 to 80;
(b) a second flexible, foraminous traveling wire having a % open area in the range of from about 20 to 80;
(c) means for directing said first and second wires together to form a nip;
(d) means for providing a web of a fiber mixture containing low melt thermoplastic fibers between said wires to said nip;
(e) means for maintaining tension on said web between said wires;
(f) means for heating said web while between said wires without direct contact with said heating means; and
(g) means for separating said web.

4,488,929
APPARATUS FOR THE PRODUCTION OF A CONTINUOUS COMPOSITE MATERIAL

Karl Ostertag, Erlenbach, Fed. Rep. of Germany, assignor to Akzona Incorporated, Enka, N.C.

Filed Jul. 20, 1983, Ser. No. 515,468
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1982, 3227144
Int. Cl.³ B32B 31/04
U.S. Cl. 156—553 1 Claim

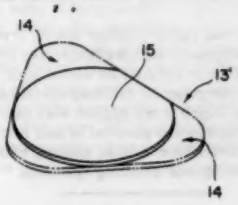


1. An apparatus for making a composite material comprising a web supply means for at least three continuous layers of sheet-like material, upper and lower rollers for feeding said layers, upper and lower comb-like guide elements, fusing means adjacent said feed rollers comprising upper and lower fusing tools, said guide elements disposed between said upper and lower rollers projecting toward said web supply means and having teeth-like extensions thereof extending rearwardly past said fusing means and spaces therebetween, said extensions of said upper guide elements having arcuate upper surfaces and flat lower surfaces, said extensions of said lower guide elements having arcuate lower surfaces and flat upper surfaces, said upper roller having arcuate segments and lands therebetween, adjacent and correspondingly arcuately shaped to said arcuate surface of said upper guide element, said lower rollers having arcuate segments and lands therebetween, adjacent and correspondingly arcuately shaped to said arcuate surface of said lower guide element, a space between said upper feed roller and said upper guide defining a first path for feeding said upper layer of said sheet-like material therebetween, a space between said upper guide and said lower guide defining a second path for feeding an intermediate layer of said sheet material therebetween, a space between said lower feed roller and said lower guide element defining a third path for feeding said lower layer of said sheet-like material therebetween, a space between said teeth-like extensions of said lower guide elements and said upper fusing tool defining an extension of said first path, a space between said teeth-like extensions of said upper guide element and said lower fusing tool defining an extension of said third path, said second path intercepting said first path in first linear zones between lands of the upper feed roller and the flat upper surfaces of the teeth-like extensions of the lower guide element and remaining co-extensive therewith until past said fusing means, said spaces between said extension of said upper guide element each coinciding with one of said first linear zones, said second path intercepting said third path in second linear zones, displaced laterally from said first linear zones, between lands of the lower feed roller and the flat lower surface of the teeth-like extensions of said upper guide element and remaining co-extensive therewith until past said fusing means, said spaces between said extensions of said lower guide element each coinciding with one of said second linear zones.

4,488,930
PROCESS FOR PRODUCING CIRCULAR GALLIUM ARSENIDE WAFER

Kiyohiko Koe, Hyogo, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 227,117, Jan. 21, 1981, abandoned. This application May 28, 1982, Ser. No. 382,979
Claims priority, application Japan, Jan. 26, 1980, 55-8086
Int. Cl.³ C30B 29/00
U.S. Cl. 156—616 R 7 Claims



1. A process for producing circular gallium arsenide wafers comprising the steps of: growing a gallium arsenide single-crystal boule in the form of a longitudinal half of cylinder by a boat method in such a manner that the intersection of a flat surface produced by the boat method and a plane vertical to the direction of the crystal growth extends in a <110> direction;
slicing the boule into wafers to expose a (100) plane inclined by more than 0.5 degrees with respect to the (100) plane;
assembling the resulting triangular wafers into a triangular prism;
grinding the opposite edges of the flat surface of the outer periphery of said triangular prism of wafers in a direction in which the wafers are assembled and grinding away high dislocation density triangular portions of said prism, such

that said prism is ground into a generally cylindrical form; and

separating said triangular prism into discrete circular wafers.

4,488,931

PROCESS FOR THE SELF-ALIGNMENT OF A DOUBLE POLYCRYSTALLINE SILICON LAYER IN AN INTEGRATED CIRCUIT DEVICE THROUGH AN OXIDATION PROCESS

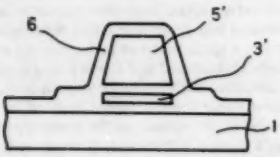
Pierangelo Pansana, Muggio, Italy, assignor to SGS-ATES Componenti Elettronici S.p.A., Agrate Brianza, Italy

Filed Mar. 26, 1984, Ser. No. 593,238

Claims priority, application Italy, Mar. 31, 1983, 20391 A/83

Int. Cl.[3] **H01L** *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **10 Claims**



1. A process for fabricating an MOS-type integrated circuit structure having a double self-aligned polycrystalline silicon layer on a predetermined area of a silicon substrate, comprising the steps of:

forming a first continuous silicon dioxide layer on said predetermined area of said substrate;

forming a first polycrystalline silicon layer on said first silicon dioxide layer such that it is insulated from said substrate at least in said predetermined area of said substrate;

forming a second silicon dioxide layer on said first polycrystalline silicon layer;

forming a second polycrystalline silicon layer on said second dioxide layer;

forming an upper structure in said predetermined area having a pre-established configuration by removing predetermined portions of said second polycrystalline silicon layer;

removing exposed portions of said second silicon dioxide layer;

wherein said second polycrystalline silicon layer is formed such that its thickness in said predetermined area is greater than that of said first polycrystalline silicon layer, and wherein said process also comprises an oxidizing operation for forming a lower structure which is self-aligned with said upper structure by converting exposed portions of said first polycrystalline silicon layer into silicon dioxide, utilizing said upper structure as a mask during said oxidizing operation.

4,488,932

FIBROUS WEBS OF ENHANCED BULK AND METHOD OF MANUFACTURING SAME

Robert J. Eber, Appleton, and Bruce W. Janda, Neenah, both of Wis., assignors to James River-Dixie/Northern, Inc., Norwalk, Conn.

Filed Aug. 18, 1982, Ser. No. 409,055

Int. Cl.[3] **D21C** *9/00*

U.S. Cl. 162—9 **13 Claims**

1. A process for the production of a fibrous web which comprises:

(a) forming treated hydrophilic papermaking fibers characterized by twists, kinks and curls and having the ability to retain their characteristic shapes for only a relatively short period of time when wet with water by subjecting substantially dry natural cellulosic papermaking fibers to mechanical deformation by hammermilling without substantial fibrilation or breakage of the fibers;

(b) forming a dispersion comprising said dry treated fibers in an aqueous foam capable of supporting and transporting said fibers; and

(c) forming a dewatered fibrous web from said dispersion within a period of time within the range of 0.5 to 5 minutes following the addition of said dry treated fibers to said aqueous foam.

4,488,933

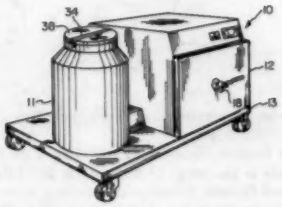
SMALL SOLVENT RECOVERY UNIT

Charles K. Claunch, and David Bowes, both of Erie, Pa., assignors to Finish Engineering Company, Inc., Erie, Pa.

Filed Aug. 27, 1982, Ser. No. 412,223

Int. Cl.[3] **B01D** *3/02*

U.S. Cl. 202—83 **16 Claims**



1. A device requiring no external fluid heat transfer medium for reclaiming solvent containing contaminants comprising,

means including a boiling chamber designed, dimensioned and arranged for safely and efficiently transferring heat to a liquid organic solvent with a high contaminants loading as residue of solid contaminants settles,

said boiling chamber having a thick bottom and a thick side wall integrally connected to said bottom and made of a material of high thermal conductivity and an electrical heating element cast in said bottom, said bottom being sufficiently thick such that the heating element is completely embedded therein, said heating element having a circular portion positioned such that heat from said heating element is conducted through said bottom and up through the side wall of said boiling chamber to a level above the settled residue to solvent in said chamber yet to be evaporated,

a closure for said chamber and a condenser connected to said chamber,

said condenser having an outlet adapted to discharge into a container for condensate.

4,488,934

UPWARDLY ORIENTED STRIPPING OR RECTIFICATION APPARATUS

Salvatore J. Silvis, 140 Douglas Rd., Staten Island, N.Y. 10304

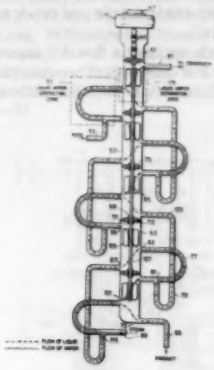
Division of Ser. No. 097,520, Nov. 26, 1979, Pat. No. 4,322,367. This application Dec. 11, 1981, Ser. No. 329,632

Int. Cl.[3] **B01D** *3/26*

U.S. Cl. 202—158 **13 Claims**

1. An upwardly oriented stripping of rectification apparatus, adapted for stripping vaporizable material from liquids, which comprises a plurality of sequentially adjacent and interconnected chambers, with terminal chambers at upper and lower ends thereof; each of the chambers including an outlet near the bottom thereof for removal from the chamber of the liquid being rectified; an inlet above the said outlet for admission to the chamber of a liquid-vapor mixture; an outlet above said inlet for excursion from the chamber of vapor; a first connecting walled passageway extending between the vapor outlet of the lower adjoining chamber and the said liquid-vapor inlet; a

second connecting walled passageway extending between the liquid outlet of the higher adjoining chamber and an inlet to the said first connecting passageway, with the proviso that the first passageway in the lower terminal chamber extends between a steam or stripping gas inlet and the said vapor-liquid inlet of the said lower terminal chamber and the second passageway is



not present in the upper terminal chamber; means for introducing feed to the stripping apparatus near the upper end thereof; means for adding steam or other stripping gas to said stripping gas inlet; and means for withdrawing stripping gas or steam and material stripped from the feed, in gaseous or vapor form, near the upper end of the apparatus.

4,488,935

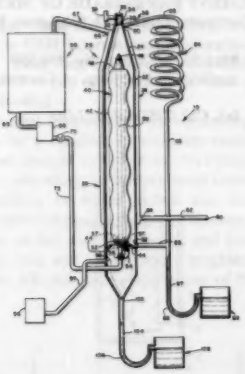
SOLAR/MICROWAVE VACUUM CONTINUOUS FEED DISTILLATION APPARATUS

Rodney C. Ruhe, 1000 Willmar Ave., Willmar, Minn. 56201

Filed Mar. 22, 1982, Ser. No. 360,669

Int. Cl.³ B01D *1/22, 3/10*

U.S. Cl. 202—177 **7 Claims**



1. An apparatus for the distillation of a fluid comprising:

a microwave energy source for vaporizing a fluid within a wave guide;

a hollow wave guide operatively connected thereto;

an evaporator surface disposed within and concentric to the axis of said wave guide extending substantially the entire length of said wave guide;

a first orifice for the introduction of a distilland fluid onto said evaporator surface;

a second orifice disposed on the surface of said wave guide for the collection of any distillate generated within said wave guide;

a third orifice disposed on the surface of said wave guide which is located at a point which is substantially the lowest elevation within said wave guide, for the collection of a residue fluid generated with said wave guide; and

condensing means for condensing vapor within said wave guide.

4,488,936

HEAT INPUT CONTROL OF AN EXTRACTIVE DISTILLATION COLUMN

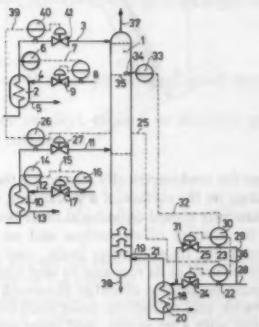
Gerhard Preusser; Klaus Richter, both of Essen, and Martin Schulze, Neviges, all of Fed. Rep. of Germany, assignors to Krupp-Koppers GmbH, Essen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 410,819, Aug. 23, 1982, abandoned, which is a continuation of Ser. No. 135,626, Mar. 31, 1980, abandoned. This application Mar. 10, 1983, Ser. No. 474,315

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1979, 2916175

Int. Cl.³ B01D *3/42; C07C 7/08*

U.S. Cl. 203—1 **17 Claims**



1. In the process for the operation of an extractive distillation column serving for the separation of aromatic hydrocarbon mixtures, using N-formylorpholine as extractant and operated without reflux, the improvement for controlling the amount of heat introduced into said column and therewith diminishing the loss of aromatic compounds comprising: supplying a first and major portion of the required heat to the bottom of said column, sensing the temperature at, at least one point located in the upper half of said column and supplying a second and minor portion of the required heat to the bottom of said column in response to said sensed temperature.

4,488,937

SEPARATION OF M-XYLENE FROM O-XYLENE BY EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 S. Third Ave., and An-I Yeh, 1014 S. Sixth Ave., both of Bozeman, Mont. 59715

Filed Apr. 11, 1984, Ser. No. 599,277

Int. Cl.³ B01D *3/40; C07C 7/08*

U.S. Cl. 203—51 **2 Claims**

1. A method for recovering m-xylene from a mixture of m-xylene and o-xylene which comprises distilling a mixture of m-xylene and o-xylene in a rectification column in the presence of an effective amount of an extractive agent, recovering essentially pure m-xylene as overhead product and obtaining the extractive agent and o-xylene from the stillpot or reboiler, the extractive agent includes sulfolane.

4,488,938

METHOD AND APPARATUS FOR COULOMETRIC MEASUREMENT

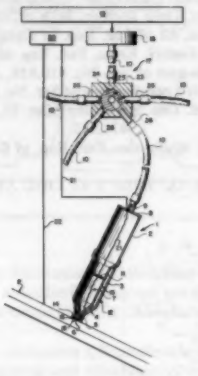
Ivan Jirovs y; Zorjan Jojko; Ivan Kokoska; Jaroslav Prusek, and Václav Trojan, all of Prague, Czechoslovakia, assignors to Statni vyzkumny ustav ochrany materialu G.V. Akimova, Prague, Czechoslovakia

Continuation-in-part of Ser. No. 273,085, Jun. 12, 1981, abandoned. This application Dec. 28, 1981, Ser. No. 335,095

Claims priority, application Czechoslovakia, Jul. 24, 1980, 5236-80; Dec. 29, 1980, 9431-80; Aug. 7, 1981, 5958-81

Int. Cl.³ G01N *27/26, 27/42*

U.S. Cl. 204—1 T 21 Claims



1. In a system for coulometrically measuring the thickness of a metallic coating on the surface of a workpiece, a probe comprising a substantially closed cylindrical inner body defining a chamber for the storage of electrolyte and an outer sleeve shaped conformingly to said inner body, said outer sleeve being sealingly secured at its rear end to said inner cylindrical body and forming an annular chamber therewith sealed at the rear end therewith, said cylindrical inner body being provided at a forward end with a jet nozzle, said outer sleeve having a cuff surrounding said nozzle for placement in contact with the surface of said workpiece to seal the area about said jet nozzle, means connected to the rear end of said cylinder for imposing oscillating pressure pulses on said electrolyte whereby said electrolyte is caused to impinge on the surface of said workpiece and circulate into said annular chamber.

14. A method for coulometrically measuring the thickness of a metallic coating on the surface of a workpiece comprising the steps of storing electrolyte within a substantially closed cylinder having a capillary opening at one end a sleeve surrounding said cylinder and defining therewith an annular chamber sealed at its upper end and a cuff surrounding said capillary opening, applying an oscillating pressure pulse on the electrolyte within said cylinder to correspondingly eject and retract said electrolyte through said capillary opening against the surface of said workpiece and into said annular chamber while simultaneously applying an electrical current through said electrolyte to effect an electrolytic reaction with the metal on the surface of said workpiece.

4,488,939

VAPOR CORROSION RATE MONITORING METHOD AND APPARATUS

John W. Fu, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

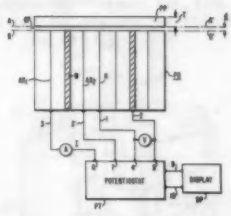
Filed Jan. 28, 1983, Ser. No. 461,797

Int. Cl.³ G01N *27/46*

U.S. Cl. 204—1 T 7 Claims

7. A method of measuring corrosion rate in condensed vapor by the electrochemical polarization technique involving: a probe including a main planar body of electrically insulating material having a front face and a reference electrode, a test electrode and two auxiliary electrodes straddling said test electrode, said electrodes being embedded in said planar body up to said front face; a plate member of electrically insulating material facing said front face a distance therefrom to define a crevice there-between; said probe being exposed in said vapor to form a film of vapor condensate in said crevice; the method comprising the steps of:

in a calibration mode applying a first AC current of magnitude I through a first current path between said two auxiliary electrodes, measuring the first path resistance R



through the condensed vapor and computing from said resistance R the resistivity of said vapor condensate;

in a testing mode applying a second AC current of magnitude I′ through a second current path between one of said auxiliary electrodes and said test electrode, concurrently measuring a potential decrement between said reference electrode and said test electrode, computing the resistance R′ in said second path from said computed resistivity, determining a voltage drop I′R′ with said computed resistance R′ and compensating said potential decrement with said voltage drop thereby to establish a corrosion rate value.

4,488,940

PROCESS FOR THE PRODUCTION OF DENTAL REPLACEMENT PARTS MADE OF METAL

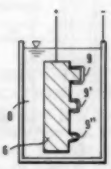
Horst Wismann, Gartenstr. 22, D-8162, Schliersee, Fed. Rep. of Germany

Filed May 12, 1983, Ser. No. 494,090

Claims priority, application Fed. Rep. of Germany, May 14, 1982, 3218300

Int. Cl.³ C25D *1/10, 1/20*

U.S. Cl. 204—4 18 Claims



1. In a process for the production of dental replacement parts of non-uniform shape made of precious metal, comprising the steps of producing a model of the replacement parts and, then, with the model, producing the casting mold from an elastic plastic and producing with the mold a cast of the dental replacement part at a casting temperature compatible with the plastic, and

in producing the cast, using a metal having a melting point substantially lower than that of the precious metal, and then coating the cast galvanically with a layer of the

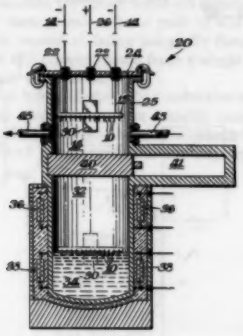
precious metal and then removing the cast with the remaining layer being the dental replacement part.

4,488,941

ELECTROPLATING METHOD FOR PRODUCING POROUS TANTALUM CAPACITOR ELECTRODE

Gordon R. Love, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Sep. 27, 1982, Ser. No. 423,966
Int. Cl.³ C25D 5/02, 3/66; C25C 3/26
U.S. Cl. 204—15 **8 Claims**



1. An electroplating method for producing a high-surface-area tantalum capacitor electrode comprising inserting a portion of a tantalum lead as the cathode in an electroplating cell containing a solution of a tantalum fluoride in a molten alkali-halide and passing sufficient current to deposit a high-surface-area tantalum sponge onto said tantalum-lead portion.

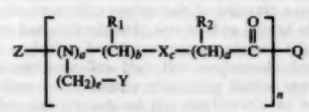
4,488,942

ZINC AND ZINC ALLOY ELECTROPLATING BATH AND PROCESS

Sylvia Martin, Utica, and R. Wilbur Herr, Troy, both of Mich., assignors to OMI International Corporation, Warren, Mich.

Filed Aug. 5, 1983, Ser. No. 520,081
Int. Cl.³ C25D 3/22, 3/56
U.S. Cl. 204—44.2 **27 Claims**

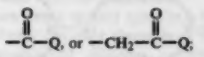
1. An aqueous bath suitable for electrodepositing zinc and zinc alloys on a conductive substrate comprising zinc ions present in an amount sufficient to electrodeposit zinc, and in the case of a zinc alloy, additional metal ions selected from the group consisting of nickel, cobalt and iron present in an amount to electrodeposit an alloy of zinc and nickel, zinc and cobalt, zinc, nickel and cobalt; zinc and iron, zinc, iron and nickel; zinc, iron and cobalt; and a brightening amount of a bath soluble AB polyamide brightener of the structural formula:



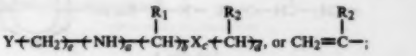
Z is —H, or

Q is —O—R_4, —NR_5R_6, or, —OM;

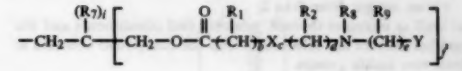
R_1 and R_2 are the same or different and are —H, —OH, an alkyl group of 1–4 carbons, an aryl group,



R_3 is



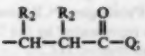
R_4, R_5 and R_6 are the same or different and are —H, or an alkyl, alkenyl, alkynyl, alkanol, alkenol, alkynol, keto alkyl, keto alkenyl, keto alkynyl, alkamine, alkoxy, polyalkoxyl, sulfoalkyl, carboxy-alkyl, mercapto alkyl, or nitriloalkyl group having from 1 to about 12 carbon atoms, phenyl, or substituted phenyl, or,



where f+i=3;

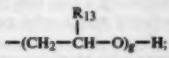
R_7 is —H, —OH, or a hydroxyalkyl group having from 1–4 carbons;

R_8 is —H, or an alkyl, alkanol, or alkamine group, having from 1–4 carbons, or



R_9, R_{10} and R_{11} are the same or different and are —H, or an alkyl group of 1–4 carbons;

R_{12} is —H, or an alkanol, alkamine, sulfoalkyl, carboxyalkyl, hydroxyaryl, sulfoaryl, carboxyaryl, or aminoaryl having from 1 to about 10 carbons; or,

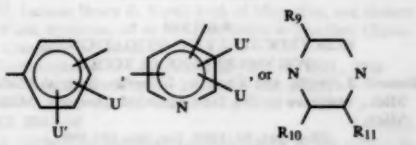


R_{13} is —H, alkyl, alkenyl, or, alkynyl of 1–4 carbons or, —CH_2—O—R_{14};

R_{14} is —H, alkyl, alkenyl, or alkynyl of 1–4 carbons;

M is H, Li, Na, K, Be, Mg, or Ca;

X is



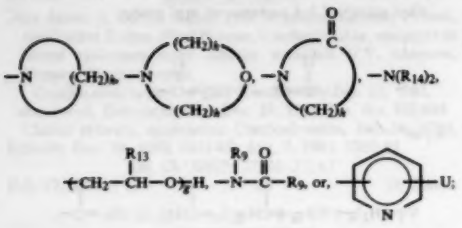
U and U' are the same or different and are H, Cl, Br, F, —NO_2, —SO_3M, or, —O—R_4;

Y is —O—R_{12}, —$N(R_{12})_2$, —SO_3M, —CO_2M, —SR_{12}, —CN, or, Y', except in the special case where:

b=c=0, and d=2,

then Y is limited to being selected from the group defined for Y';

Y' is —H,



a is 0 or 1;
b is an integer from 0 to 11;
c is 0 or 1;
d is an integer from 0 to 2;
e is an integer from 0 to 6;
f is an integer from 1 to 3;
g is an integer from 1 to 30;
h is an integer from 2 to 5; and
i is an integer from 0 to 2;
as well as mixtures thereof, wherein said constituents and the number thereof are selected so that the compound contains at least two amide groups.

4,488,943

POLYMER BLENDS FOR USE IN PHOTOELECTROCHEMICAL CELLS FOR CONVERSION OF SOLAR ENERGY TO ELECTRICITY AND METHODS FOR MANUFACTURING SUCH BLENDS

Terje Skotheim, East Patchogue, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 386,666, Jun. 9, 1982, Pat. No. 4,442,185, which is a continuation-in-part of Ser. No. 312,888, Oct. 19, 1981, Pat. No. 4,416,959, which is a continuation-in-part of Ser. No. 208,059, Nov. 18, 1980, Pat. No. 4,352,868. This application Dec. 9, 1982, Ser. No. 448,115

Int. Cl.³ C25D *9/02*

U.S. Cl. 204—58.5 **18 Claims**

1. A method for producing a thin film polymer blend of a highly conductive polymer and a solid polymer electrolyte comprising the steps of:

(a) preparing a substrate for receiving said film;

(b) preparing a solution of a monomer of said highly conductive polymer and a complex of said solid polymer electrolyte;

(c) immersing said substrate into said solution and by electrochemical or photoelectrochemical methods forming said polymer blend film on said substrate.

4,488,944

ELECTROCATALYTIC OXIDATION OF (POLY)ALKYLENE GLYCOLS

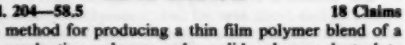
Kenneth J. Stutts, and Karel A. J. Snoble, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 19, 1983, Ser. No. 543,199

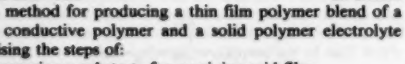
Int. Cl.³ C25B *3/02*

U.S. Cl. 204—79 **10 Claims**

1. A process for preparing dicarboxylic acids corresponding to the formula:



wherein R' independently each occurrence is hydrogen, methyl or ethyl, and n is an integer from 0 to 10, comprising contacting a (poly)alkylene glycol corresponding to the formula:



wherein R' and n are as previously defined, with electrochemically generated nickel-oxide hydroxide.

4,488,945

PROCESS FOR PRODUCING HYPOCHLORITE

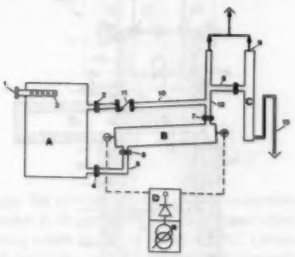
Placido M. Spaziante, Comano, Switzerland, assignor to Panclor S.A., Comano, Switzerland

Filed Oct. 19, 1983, Ser. No. 543,366

Claims priority, application Switzerland, Oct. 27, 1982, 6257/82

Int. Cl.³ C25B *1/26*

U.S. Cl. 204—95 **5 Claims**



1. A process for the electrolysis of sea water to produce hypochlorite in at least one electrolysis cell equipped with anodes and cathodes forming interelectrodic spaces, the improvement comprising admixing sea water before electrolysis with sufficient hypochlorite solution recycled from the electrolyzer to substantially oxidize bromine, iodine and sulfur impurities to their elemental forms and to maintain the temperature of the sea water feed to the electrolyzer at not less than 9.6° C.

4,488,946

UNITARY CENTRAL CELL ELEMENT FOR FILTER PRESS ELECTROLYSIS CELL STRUCTURE AND USE THEREOF IN THE ELECTROLYSIS OF SODIUM CHLORIDE

Gregory J. E. Morris, Lake Jackson; Richard N. Beaver, Angleton; Sandor Grosshandler, Houston; Hiep D. Dang, Lake Jackson, and John R. Pimlott, Sweeny, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 7, 1983, Ser. No. 472,792

Int. Cl.³ C25B *1/46, 11/03, 9/00, 13/00*

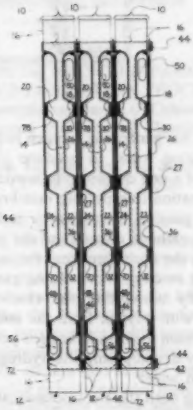
U.S. Cl. 204—98 **47 Claims**

1. In the cell structure used in forming a bipolar electrode-type, filter press-type electrolytic cell unit, which unit is capable of being combined with other cell units to form a cell series; wherein in said series the cell structure is separated from adjacent cell structures by ion-exchange permselective membranes which are sealably disposed between each of the cell structures so as to form a plurality of electrolysis cells; each of said electrolysis cells having at least one planarly disposed membrane separating the anolyte compartment and catholyte compartment of each electrolysis cell; said cell structure having a central barrier which physically separates the anolyte compartment of an electrolysis cell located on one side of the barrier from the catholyte compartment of an adjacent electrolysis cell located on the opposite side of the barrier; said central barrier having a planarly disposed anode situated in its adjacent anolyte compartment and a planarly disposed cathode situated in its adjacent catholyte compartment with both electrode faces being substantially parallel to their planarly disposed membranes; said central barrier having the anode of the adjacent anolyte compartment electrically connected through

it to the cathode of the adjacent catholyte compartment; said anolyte and catholyte compartments which are adjacent to the central barrier having a peripheral structure around their periphery to complete the physical definition of said compartments; said cell structure also having an electrical current transfer means associated with it for providing electrical current paths through the central barrier from its adjacent catholyte compartment to its adjacent anolyte compartment; and which cell structure includes anode and cathode stand-off means for maintaining the anode and cathode of the two electrolysis cells adjacent the central barrier at predetermined distances from the central barrier; the improvement which comprises:

the central barrier, the anolyte and catholyte compartment peripheral structures, the anode stand-off means, the cathode stand-off means, and at least part of the electrical current transfer means all being integrally formed into a unitary central cell element made from a single casting of a castable metal; and, further,

said castable metal being electrically conductive so as to be the part of the electrical current transfer means which transfers electricity through the central barrier from the adjacent catholyte compartment to the adjacent anolyte compartment; and



said unitary central cell element being simultaneously formed in such a fashion so as to provide the structural integrity required to physically support the adjacent electrolyte compartments while loaded with electrolyte as well as to support the associated electrolysis cell appurtances which are desired to be supported by the unitary central cell element; and

said anode stand-off means and that part of the electrical current connecting means located in the unitary central cell element on the anolyte side of the central barrier being combined into a multiplicity of anode bosses projecting a predetermined distance outwardly from the central barrier into the anolyte compartment adjacent the central barrier, said anode bosses being capable of being mechanically and electrically connected either directly to the anode of said anolyte compartment or indirectly to said anode through at least one compatible metal intermediate directly situated in an abutting fashion between said anode and said anode bosses; and

said cathode stand-off means and that part of the electrical current connecting means located on the catholyte side of the central barrier being combined into a multiplicity of cathode bosses projecting a predetermined distance outwardly from the central barrier into the catholyte compartment adjacent the central barrier, said cathode bosses being capable of being mechanically and electrically connected either directly to the cathode in said adjacent catholyte compartment or indirectly to the cathode through at least one weldably compatible metal intermediate directly situated in an abutting fashion between said cathode and said cathode bosses; and

said anode bosses being spaced apart in a fashion such that anolyte can freely circulate throughout the totality of the otherwise unoccupied adjacent anolyte compartment, and, likewise, said cathode bosses being spaced apart in a fashion such that catholyte can freely circulate throughout the totality of the otherwise unoccupied adjacent catholyte compartment.

4,488,947

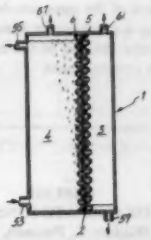
PROCESS OF OPERATION OF CATHOLYTELESS MEMBRANE ELECTROLYTIC CELL

Ronald C. Miles, Cleveland, Tenn., assignor to Olin Corporation, Cheshire, Conn.

Filed Jun. 8, 1983, Ser. No. 502,411

Int. Cl.³ C25B *1/34*

U.S. Cl. 204—98 **11 Claims**



1. In a process for the electrolysis of an aqueous electrolyte in an electrolytic cell comprised of an anode compartment having at least one anode and containing said aqueous electrolyte; a cathode compartment containing at least one cathode and a concentrated catholyte liquor; a vertically positioned cation exchange membrane which separates said anode compartment from said cathode compartment, the process improvement which comprises exposing a substantial portion of said cathode to a gaseous atmosphere, said substantial portion of said cathode not being immersed in said concentrated catholyte liquor being at least 70 percent of the active electrode area, while removing said concentrated aqueous catholyte liquor from said cathode compartment to prevent a substantial accumulation of catholyte liquor in said cathode compartment.

4,488,948

CHANNEL FLOW CATHODE ASSEMBLY AND ELECTROLYZER

Eric H. Larsen; Bruce E. Kurtz, both of Marcellus, and Robert H. Fitch, Syracuse, all of N.Y., assignors to The Dow Chemical Company, Midland, Mich.

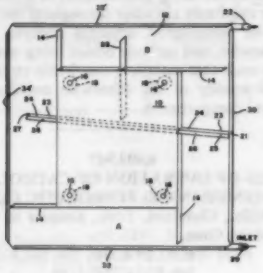
Continuation of Ser. No. 324,286, Nov. 23, 1981,. This application Aug. 11, 1983, Ser. No. 522,621

Int. Cl.³ C25B *1/34, 9/00*

U.S. Cl. 204—98 **7 Claims**

1. A method for reducing vertical mixing of the catholyte and increasing the energy efficiency of an electrolysis cell having a permselective membrane separating anode and cathode compartments in the electrolysis of an alkali metal chloride solution wherein an aqueous alkali metal chloride solution is fed to the bottom of the anode compartment and water or a dilute alkali metal hydroxide solution is fed to the bottom of the cathode compartment, chlorine gas and depleted brine are withdrawn from the top of the anode compartment and alkali metal hydroxide solution and hydrogen gas are withdrawn from the top of the cathode compartment, the improvement

comprising reducing the vertical mixing of the alkali metal hydroxide solution in the cathode compartment with a baffle between the cathode and the permselective membrane attached perpendicularly to the face of the cathode and extending diagonally upward from one side of the cathode compartment to a point short of the opposite side of the cathode compartment providing a passage for fluid flow in the cathode compartment between the end of the baffle and said opposite side of the cathode compartment.



4,488,949

REMOVAL OF SULFATE IONS FROM BRINE

John M. Lee, and William C. Bauman, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 307,826, Oct. 2, 1981, Pat. No. 4,405,576. This application Sep. 19, 1983, Ser. No. 533,713
The portion of the term of this patent subsequent to Sep. 20, 2000, has been disclaimed.
Int. Cl.³ B01J 41/12; C02F 1/42
U.S. Cl. 521—28 7 Claims

1. A method for substantially removing sulfate, borate, bicarbonate and/or phosphate ions from a NaCl brine feed to an electrolytic cell wherein NaCl is electrolyzed to produce chlorine and sodium hydroxide, said method comprising

passing said NaCl brine through a vessel containing a particulate, macroporous cation exchange resin composite having sulfonic acid functional groups and having hydrous zirconium oxide and polyacrylic acid contained therein,

removing from contact with resin composite in said vessel, the NaCl brine with its sulfate, borate, bicarbonate and/or phosphate ions substantially removed, and

thereafter feeding said NaCl brine to the said electrolytic cell.

4,488,950

HEAVY METAL SEPARATION FROM COPPER-BEARING WASTES

Frederick D. Pooley; Huw O. Jones, and Barry I. Wheatley, all of Cardiff, Wales, assignors to National Research Development Corporation, London, England

Filed Dec. 29, 1983, Ser. No. 566,662
Int. Cl.³ C25C 1/16
U.S. Cl. 204—116 7 Claims

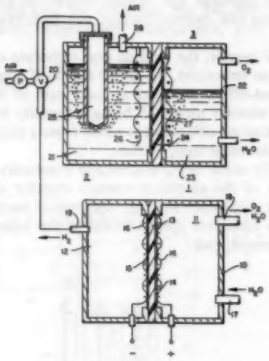
7. The method according to claim 1, wherein the added zinc has a surface area of at least 1 m^2/g.

4,488,951

INTEGRATED ELECTROCHEMICAL/CHEMICAL OXYGEN GENERATING SYSTEM

Mary E. Nolan, Topsfield, and Anthony B. LaConti, Lynnfield, both of Mass., assignors to General Electric Company, Wilmington, Mass.

Filed Nov. 4, 1983, Ser. No. 549,344
Int. Cl.³ C25B 1/10, 1/30, 9/00
U.S. Cl. 204—129 13 Claims



1. A process for generating oxygen including the steps of:

(a) electrolyzing water to produce oxygen in the anode chamber of a cell divided into anode and cathode chambers by a cation transporting membrane;

(b) forming gaseous hydrogen by reduction of hydrogen ions in the cathode chamber of the cell;

(c) removing the hydrogen from the cathode chamber;

(d) providing an oxygen containing gaseous stream;

(e) chemically converting the electrolytically produced hydrogen with oxygen from the said oxygen containing gaseous stream to form hydrogen peroxide;

(f) chemically decomposing the hydrogen peroxide to form oxygen and water;

(g) recovering both the electrochemically produced oxygen and the chemically produced oxygen as product whereby the electrochemically produced hydrogen is safely disposed of and additional oxygen is produced by chemical extraction thereof from an oxygen containing gas stream.

4,488,952

METHOD OF DESULPHURIZATION OF COAL

Rengarajan Soundararajan, Oregon County, Mo., assignor to Research Manufacturing Consultation Corporation, Alton, Mo.

Filed Dec. 16, 1983, Ser. No. 562,153
Int. Cl.³ B01J 19/12
U.S. Cl. 204—158 R 7 Claims

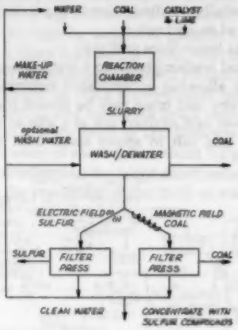
1. A method of coal desulphurization comprising:

preparing an aqueous suspension of said coal, said suspension including an inorganic basic substance and said coal being present in particle sizes of no greater than about one inch in average diameter;

providing a photoelectric catalyst in said suspension characterized by structural imperfections thereby being capable of supporting a free radical reaction;

subjecting said coal particles to electromagnetic waves having an energy level greater than the carbon-sulfur bond

energy in said coal thereby initiating a free radical reaction of said sulfur;



and

separating the components of said reaction.

4,488,953

PURIFICATION OF RECYCLED PARAFFINS IN PHOTOCHLORINATION PROCESS

David Y. Tang, Tonawanda, and James G. Colson, Williamsville, both of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Jun. 13, 1983, Ser. No. 504,005

Int. Cl.³ C07C *17/00, 26/00*

U.S. Cl. 204—163 R **9 Claims**

1. A process for the mono-chlorination of alkanes which comprises contacting normal alkanes containing from about 6 to about 20 carbon atoms with gaseous chlorine in a photochlorination reactor, said photochlorination step being conducted at a rate to substantially prevent the formation of alkyl polychlorides, passing the product stream from said photochlorination reactor into contact with benzene, separating unreacted normal alkanes from said product stream, passing said unreacted normal alkanes into contact with a basic material capable of removing polar impurities therefrom, and recycling the thus purified unreacted normal alkanes to said photochlorination reactor.

4,488,954

METHOD OF TREATING INNER SURFACE OF PLASTIC TUBE WITH PLASMA

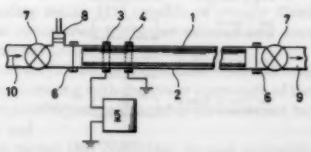
Kenji Hatada, Shiga; Osamu Miyajima, and Hiroaki Kobayashi, both of Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Mar. 3, 1983, Ser. No. 471,734

Claims priority, application Japan, Mar. 12, 1982, 57-37911

Int. Cl.³ H05H *1/24*

U.S. Cl. 204—169 **9 Claims**



1. A method of plasma-treating the inner surface of a plastic tube comprising the steps of:

placing said plastic tube inside an electrically insulating tube, so that the difference between the inner diameter of said electrically insulating tube and the outer diameter of said plastic tube is equal to or less than 2 mm,

flowing a gas into said electrically insulating tube and said plastic tube,

maintaining the inner pressure of both of said tubes at a reduced pressure, and

applying a high voltage across electrodes disposed outside said electrically insulating tube so as to initiate and sustain discharge only inside said plastic tube and thereby plasma-treating the inner surface of said plastic tube.

4,488,955

SUB-CATHODIC SHIELD WITH DEFORMABLE ZONES FOR HALL-HEROULT ELECTROLYSIS CELLS

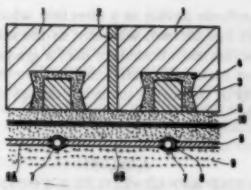
Yves Bertaud, and Michel Leroy, both of Saint Jean de Maurienne, France, assignors to Aluminium Pechiney, Paris, France

Filed May 14, 1984, Ser. No. 610,118

Claims priority, application France, May 16, 1983, 83 08333

Int. Cl.³ C25C *3/08, 7/00*

U.S. Cl. 204—243 R **8 Claims**



1. In an electrolysis cell for production of aluminum by the Hall-Heroult process, wherein the cell is contained in a housing, the base of which is coated by a refractory and insulating material, and wherein the cathode of said cell comprises carbonaceous blocks above said base in which blocks cathodic bars are embedded, a steel metallic shield for preventing seepage of metal and constituents of the electrolysis bath into the insulating coating and housing of said cell, said shield comprising:

at least one continuous steel sheet extending substantially over the total area between the base of the cathode and the base of the housing, at least half the surface area of which sheet is at least 5 mm thick, and which has at least one deformable zone for absorbing thermal stresses caused by differences in temperature between the shield section situated below the central area of the cathode, and the section situated below the peripheral area of the cathode, said deformable zone comprising at least one closed profile, the wall of thickness of which is less than the thickness of the remainder of the shield.

4,488,956

HIGH-POWER CATHODE SYSTEM FOR PRODUCING MULTILAYERS

Michael Scherer, Rodenbach, and Karl-Heinz Kubacha, Bruchköbel, both of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne and Glyco-Metal Werke, Weisbaden, both of, Fed. Rep. of Germany

Filed Dec. 22, 1983, Ser. No. 564,300

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 3248121

Int. Cl.³ C23C *15/00*

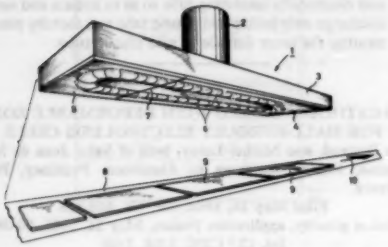
U.S. Cl. 204—298 **8 Claims**

1. A high-power cathode system for producing layers of different materials on a substrate, comprising:

a high power cathode device having a target of at least two different materials, each two materials abutting each other at a boundary line therebetween, and means, including a discharge-concentrating, closed-figure magnetic field generator, for producing a glow discharge of the target

materials at least across the boundary line therebetween, whereby, because the target materials abut, the magnetically-concentrated glow discharge cannot escape through the target; and

means for transporting a substrate in layer-coating relation to the glow discharge of the target materials of the high



power cathode device in a direction which crosses each boundary line thereof, whereby, as the substrate is transported across each boundary line, a gradual transition of the target materials coated thereon occurs for adhering the layers of the target materials coated therebefore and thereafter.

4,488,957

METHOD AND APPARATUS FOR PRODUCTION OF CRYSTALLIZABLE CARBONACEOUS MATERIAL

Kosaku Noguchi, Tokyo; Honami Tanaka, Osaka; Yukimasa Kumura, Osaka; Eiji Kitajima, Osaka, Toshifumi Ishitobi, and Hirokazu Teraoka, Osaka, all of Japan, assignors to Koa Oil Company, Ltd., Tokyo, Japan

Filed May 26, 1982, Ser. No. 382,360

Claims priority, application Japan, Jun. 1, 1981, 56-83965

Int. Cl.[3] C10C *3/00*; D01F *9/12, 9/20*

U.S. Cl. 208—40 **10 Claims**

1. A method of producing a crystallizable carbonaceous material which comprises:

(1) heating a heavy oil at a temperature of 400° to 500° C. and for a time sufficient to carry out a polycondensation reaction thereby producing a pitch containing mesophase microspheres;

(2) cooling the thus-produced pitch at a temperature between 200° to 400° C., provided that the cooling temperature is from 50° to 200° C. lower than the polycondensation reaction temperature;

(3) subjecting the thus-cooled pitch at a temperature between 200° to 400° C. to a turbulent flow sufficiently to agglomerate the mesophase microspheres containing quinoline insolubles; and

(4) separating the agglomerates from the pitch.

4,488,958

METHOD OF PREPARING HIGHLY PURIFIED KILN DRIED SOLAR SALT

Joy L. Williams, Newark; David L. Rose, Fremont, and Louis M. Haas, Newark, all of Calif., assignors to Cargill, Incorporated, Minneapolis, Minn.

Filed Dec. 20, 1982, Ser. No. 451,005

Int. Cl.[3] B03B *7/00*

U.S. Cl. 209—2 **5 Claims**

1. A process for producing solar salt of very high purity from partially purified salt initially having an insoluble concentration of below about 0.04 weight percent, the process comprising,

presifting said partially purified salt through a first screen of ¼" or lower number Tyler mesh,

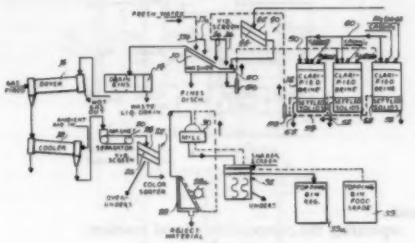
presifting the salt which passed through said first screen with a second screen of 3 or higher number mesh Tyler,

washing said salt retained by said second screen in a clarified, substantially purified brine to separate insoluble particles adhered to said salt,

draining excess brine from said salt,

transferring said washing brine to a settling tank to reclarify the same by allowing accumulated insoluble particles to settle, whereby said brine may be reused for washing,

blowing air over said drained salt in a kiln to raise the temperature of said salt to above about 250° F. to remove



residual water therefrom and to blow salt fines and fine insoluble particles from the salt,

cooling said salt, passing said cooled salt through a magnetic separator to remove magnetic impurities

passing said cooled salt over a third screen of between ¼" and 3 Tyler mesh allowing the major portion of said salt to sift through while retaining the major portion of insoluble lumps, and

passing the portion of salt that passed through said third screen over a fourth screen of between a 7 and a 10 Tyler mesh which retains the major portion of said salt but sifts through the major portions of small insoluble particles.

4,488,959

SCHEELITE FLOTATION PROCESS

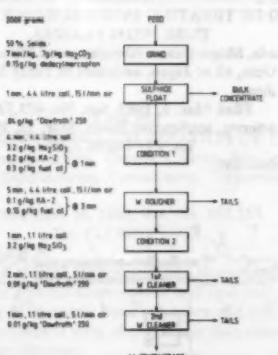
Gordon E. Agar, 123 Avodale Ct., Burlington, Ontario, Canada L7L 2M8

Filed Sep. 13, 1982, Ser. No. 416,915

Claims priority, application United Kingdom, Sep. 21, 1981, 8128467

Int. Cl.[3] B03D *1/14*

U.S. Cl. 209—167 **15 Claims**



1. A process of separating scheelite from gangue in an ore, which process comprises grinding the ore with 4 to 10 grams of an alkali metal carbonate per kilogram of ore, selectively separating sulphide minerals present in a pulp of the ore and then

subjecting the pulp comprising desulfided pulp and pulp liquor to froth flotation to separate selectively scheelite, said flotation being carried out in the presence of a paraffin oil, from 0.1 to 0.4 gram of a fatty acid or a soap thereof per kilogram of ore and from 3.2 to 5.5 grams of sodium silicate per kilogram of ore, wherein the ratio by weight of paraffin oil to fatty acid is in the range of from 0.5:1 to 2.8:1 and wherein the amount of oil, alkali metal carbonate and sodium silicate are so correlated that a stable height of froth is maintained on top of the pulp during the flotation, and said froth being controlled by adjusting the sodium silicate level in the flotation to obtain a dissolved silicate level of about 0.8 to about 1.2 grams per liter of pulp liquor and adjusting the initial alkali metal carbonate level according to the condition of the froth at such dissolved silicate level.

4,488,960

BIOLOGICAL REACTOR APPARATUS FOR BIOLOGICAL DECOMPOSITION OF ORGANIC REFUSE

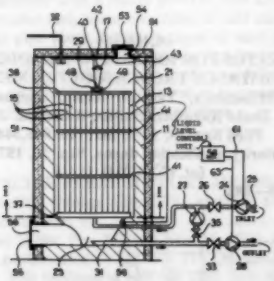
Lothar Goerlich, Dissen, Fed. Rep. of Germany, assignor to UTB Umwelttechnik Buchs AG, Buchs, Switzerland

Filed Aug. 2, 1983, Ser. No. 519,693

Claims priority, application Switzerland, Aug. 6, 1982, 4744/82

Int. Cl.³ C02C *1/04*

U.S. Cl. 210—97 **20 Claims**



1. A biological reactor apparatus for biological decomposition of organic refuse, particularly sewage sludge, liquids with high organic waste contents, and the like, comprising

a closed vessel (**11**) for anaerobic bacterial decomposition of the refuse;

a plurality of essentially vertical ducts (**18**) having upper and lower open ends and having walls capable of being covered by microorganisms located in said vessel;

inlet means (**25, 24, 26**) for the organic refuse;

distributing means (**17**) capable of evenly distributing organic refuse over the upper ends of said ducts (**18**) and connected to said inlet means (**17**);

outlet means (**31, 33, 28**) connected with said vessel (**11**) and communicating with the lower open ends of the ducts (**18**) to remove organic refuse after its treatment in said vessel (**11**), and

control means (**58**) connected to and controlling flow of refuse through at least one of the inlet and outlet means (**25, 24, 26; 31, 33, 28**) to maintain a liquid level in said vessel (**11**) intermediate the upper and lower ends of said ducts (**18**).

4,488,961

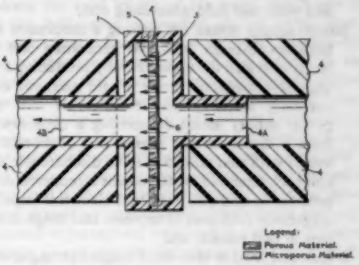
ONE-WAY FILTER UNIT

Dudley W. C. Spencer, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 29, 1982, Ser. No. 427,455

Int. Cl.³ B01D *35/04*

U.S. Cl. 210—136 **6 Claims**



2. A one-way filter unit for filtering unused dialysate during infusion thereof into the peritoneal cavity of a pertioneal dialysis patient, which filter unit comprises

(a) a housing having two inlet/outlet ports, one inlet/outlet port adapted for connection to a reservoir of unused dialysate or a container for collection of used dialysate, and the other inlet/outlet port adapted for connection to the patient's peritoneal cavity;

(b) a porous support plate disposed transversely to dialysate flow within said housing; and

(c) a flexible membrane filter element or elements attached in a flexible region to the porous support plate, such that the filter element or elements are maintained in a filtering position during transmission of unused dialysate from the reservoir through said housing and into the patient's peritoneal cavity, and in a free-flow position during during transmission of dialysate from the patient's peritoneal cavity through the filter unit to a container for the collection of used dialysate.

4,488,962

MAGNETIC FILTERING APPARATUS

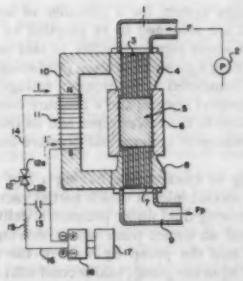
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Jan. 12, 1982, Ser. No. 338,903

Claims priority, application Japan, Jan. 16, 1981, 56-3821

Int. Cl.³ B01D *35/06*

U.S. Cl. 210—138 **11 Claims**



1. An apparatus for filtering a magnetically susceptible substance in a fluid, comprising:

a matrix of magnetizable material which, when magnetized,

provides a multiplicity of regions of high magnetic field gradients and which is received in an enclosure;

means for passing said fluid through said matrix in said enclosure;

external magnetic circuit means for magnetizing said matrix to magnetically collect said magnetically susceptible substance from said fluid, said magnetic circuit means including a field generating coil and a magnetic conductor arranged to form a closed magnetic circuit with said matrix and with said field generating coil;

power supply means for passing a succession of electrical impulses through said field generating coil to intermittently energize the same, thereby producing a sequence of impulsive magnetic fluxes in said magnetic circuit to recurrently intensify magnetization of said matrix, said power supply means comprising a capacitor chargeable from a direct-current source and connected via switch means with said coil so as to be dischareable through said coil each time said switch means is rendered conductive to produce in said coil each said electrical impulse having a magnitude sufficient to increase said magnetic field gradients in said matrix; and

at least one hard or semi-hard magnet arranged in series with said matrix in said magnetic circuit for producing a generally static magnetic flux therein sufficient to maintain said matrix magnetized each time said electric impulse passing through said field generating coil decays.

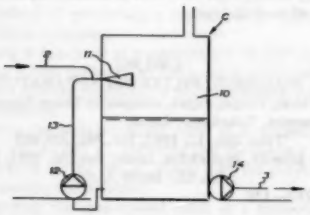
5. The apparatus defined in claim 1 wherein said switch means is associated with timing circuit means for periodically rendering it conductive to develop a succession of said electrical impulses in said coil.

4,488,963

SEWAGE SYSTEM FOR WASTE WATER

Bo G. Hellers, Malmö, Sweden, assignor to Evak Sanitar AB, Bromolla, Sweden

Filed Feb. 7, 1980, Ser. No. 119,330
Claims priority, application Sweden, Feb. 14, 1979, 7901303
Int. Cl.³ C02F 3/02
U.S. Cl. 210—170 7 Claims



1. A sewage system for a plurality of sewage producing units, which are arranged to be emptied by applying partial vacuum to a sewer pipe connected to said sewage producing units comprising a group of sewage producing units; a group of sewer pipes connected to the group of sewage producing units; a remote transport system; and a pressure converter having an inlet connected to the sewer pipes and an outlet connected to the remote transport system, said pressure converter comprising:

a jet pump of ejector type having a first inlet for driving fluid, a second inlet at which partial vacuum is developed when driving fluid under pressure is delivered to said first inlet, and an outlet from which driving fluid and fluid drawn into the pump by way of the second inlet are ejected from the pump, said second inlet being the inlet of the pressure converter and said jet pump being operative to draw sewage through said sewer pipes and eject sewage from the jet pump by way of the outlet thereof;

a container under atmospheric pressure connected to the outlet of the jet pump for receiving sewage and driving fluid which are ejected therefrom;

a second pump connected to draw waste water from the container and deliver it to the first inlet of the jet pump as driving fluid; and

a waste water pump having an inlet connected to said container and an outlet which is the outlet of the converter, said waste water pump being operative to pump the contents out of said container under superatmospheric pressure into the remote transport system.

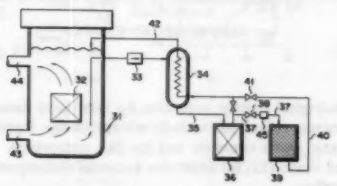
2. A sewage plant for a plurality of sewage producing units comprising a group of sewage producing units; a group of sewer pipes connected to the sewage producing units respectively; a remote transport system; and a pressure converter connected to receive sewage from the sewer pipes and deliver it under excess pressure into the remote transport system, the pressure converter including pump means connected to the sewer pipes for conveying sewage along the sewer pipes by establishing a partial vacuum therein, and a container which is exposed to atmospheric pressure and through which sewage received from the pump means passes before being delivered into the remote transport system.

4,488,964

APPARATUS FOR REMOVING A RADIOACTIVE SUBSTANCE FROM A MOLTEN METAL

Norimasa Mitsutsuka, Yamato, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 25, 1978, Ser. No. 945,344
Claims priority, application Japan, Sep. 30, 1977, 52-116598
Int. Cl.³ B01D 35/18
U.S. Cl. 210—182 3 Claims



1. An apparatus for removing a radioactive substance from a molten metal which comprises a cold trap for crystallizing an impurity out of the molten metal; a radioactive substance-adsorbing unit in which a radioactive substance-adsorbing material is filled with a specific surface area of at least 10 cm^2/cm^3; means for conducting the molten metal from the cold trap to the radioactive substance-adsorbing unit; means positioned between said cold trap and said adsorbing unit for heating the molten metal delivered from the cold trap to the radioactive substance-adsorbing unit; and means adapted for controlling the temperature of the heating means by measuring the temperature of the cold trap and radioactive substance-adsorbing unit, whereby the temperature in said adsorbing unit is maintained above the minimum temperature in said cold trap.

4,488,965

ARRANGEMENT FOR FASTENING FILTER CANDLES AND FILTER APPARATUS PROVIDED THEREWITH

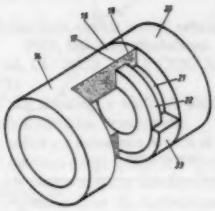
Hans Müller, Erlenbach, and Ivo Schumacher, Mannedorf, both of Switzerland, assignors to DrM, Dr. Müller AG, Mannedorf, Switzerland

Filed Jul. 5, 1983, Ser. No. 510,744

Claims priority, application Switzerland, Jul. 5, 1982, 4079/82; Dec. 7, 1982, 7100/82

Int. Cl.³ B01D *29/32*

U.S. Cl. 210—232 12 Claims



2. An arrangement for attaching a filter candle to a collecting pipe of a pressure filter apparatus, comprising

a T-shaped pipe piece having a substantially horizontal portion fitted in a collecting pipe of a pressure filter and a substantially vertical portion, said vertical portion having an end portion, said end portion being formed with a semicircular recess, said recess defining a semicircular segment-shaped projection, said semicircular segment-shaped projection being formed with a groove facing toward said recess, a filter candle including an upper end portion formed with a flange portion, said flange portion being circular and, upon attaching of said candle to said T-shaped pipe piece, being engaged in said groove in a form-locking manner; and an insert ring inserted into said recess in a form-locking manner after said flange portion has been engaged in said groove so as to cover said recess and provide for a smooth outer surface.

4,488,966

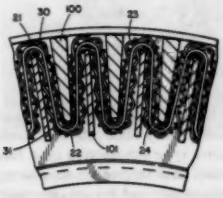
FILTER PLEAT SUPPORT MEANS

John I. Schaeffer, Orange City, Fla., assignor to Brunswick Corporation, Skokie, Ill.

Continuation of Ser. No. 302,148, Sep. 14, 1981, abandoned, which is a continuation of Ser. No. 114,736, Jan. 24, 1980, abandoned. This application Sep. 30, 1982, Ser. No. 429,887

Int. Cl.³ B01D *27/06*

U.S. Cl. 210—485 7 Claims



1. A fluid filter element for use in a system having fluid flowing first in one direction through the filter element and the flow then being reversed to flow in the opposite direction through the filter element, the filter element comprising:

(a) a pair of spaced end caps;

(b) a pleated filter media comprised of substantially rigid pleated porous metal material extending between the end caps and secured thereto, the media having a plurality of spaced apart outer pleats with outwardly projecting crowns and a plurality of spaced apart inner pleats with inwardly projecting apexes;

(c) first spacer means not secured to the filter media, having at least a portion situated between adjacent outer pleats and extending continuously between the end caps and mounted in juxtaposed relationship with the adjacent outer pleats to maintain a separation between the outer pleats along the axial length of the outer pleats and to prevent the ballooning movement of the outer pleats toward each other when the fluid is forced through the media in a direction from the inner pleats through the outer pleats, the first spacer means are wedge shaped members having a wide part near the crowns and a narrower part near the apexes and each wedge shaped member has opposite free face portions in non-attached supporting relationship with the adjacent outer pleats; and

(d) second spacer means not secured to the filter media having at least a portion situated between adjacent inner pleats and extending continuously between the end caps and mounted in juxtaposed relationship with the adjacent inner pleats to prevent the ballooning movement of the inner pleats toward each other when the fluid is forced through the media in a direction opposite to the first named direction of forced flow, the second spacer means are shim members with each shim member having opposite free face portions in non-attached relationship with the adjacent inner pleats;

(e) the first and second spacer means having a plurality of elongated radial teeth and open spaces axially therebetween.

4,488,967

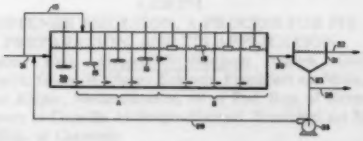
TREATMENT OF WASTEWATER CONTAINING PHOSPHORUS COMPOUNDS

Charles S. Block, Allentown, and Sun-Nan Hong, Emmaus, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 7, 1983, Ser. No. 472,452

Int. Cl.³ C02F *3/30*

U.S. Cl. 210—605 2 Claims



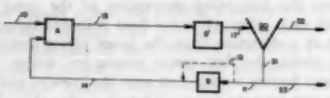
1. In a process for treating wastewater wherein phosphate-containing recycled activated biomass is first admixed in an anaerobic zone with an influent containing phosphate and BOD to form a mixed liquor and treated under anaerobic conditions such as to be substantially free of oxidizing agents and at a dissolved oxygen concentration in said mixed liquor of less than 0.7 ppm and BOD in the influent is sorbed by the biomass with release of phosphorus from the biomass: and wherein the anaerobically treated mixed liquor is subjected to contact with oxygen-containing gas under oxic conditions followed by settling of the oxically treated mixed liquor to separate out a dense sludge layer comprising activated biomass, a portion of which dense sludge is recycled to provide the biomass first admixed with said wastewater influent: the improvement which comprises introducing at least a portion of said recycled sludge, prior to its admixture with the wastewater influent, to a holding zone in which it is held under non-aeration conditions for a period of time at least sufficient to reduce any nitrates and/or nitrites contained therein, such that no significant amount of such nitrates and/or nitrites are introduced into said anaerobic zone.

4,488,968

REMOVAL OF PHOSPHATES AND BOD FROM WASTEWATERS

Sun-Nan Hong, Emmaus, and Marshall L. Spector, Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 7, 1983, Ser. No. 472,513
Int. Cl.³ C02F *3/30*
U.S. Cl. 210—605 **4 Claims**



1. In an activated biomass process wherein recycled activated biomass is (1) initially admixed with a phosphate- and BOD-containing wastewater influent to form a mixed liquor under anaerobic conditions effecting selective production of microorganisms capable of sorbing BOD under both anaerobic and oxidizing conditions, followed by (2) subjecting the mixed liquor to contact with oxygen-containing gas under oxic treating conditions effecting accumulation of phosphates in solid biomass component, and (3) subsequently separating the thus oxidized mixed liquor into supernatant liquid and biomass, a portion of which biomass is returned to said admixture with the wastewater influent to provide the aforesaid activated biomass; the improvement which comprises:

maintaining the mixed liquor in contact with oxygen-containing gas under said oxic conditions for a time sufficient to cause sorption of BOD and P from the surrounding liquor, but less than that required to effect 40% oxidation of the sorbed BOD, and separately subjecting at least part of the recycled portion of the biomass to further oxidation by contact high oxygen-containing gas prior to admixture of said recycled biomass with the wastewater influent, such that any bleed back of phosphorus from the sludge to the liquor is reversed during the separate oxidation and at least 50% of the total soluble and insoluble BOD is removed in the overall process.

4,488,969

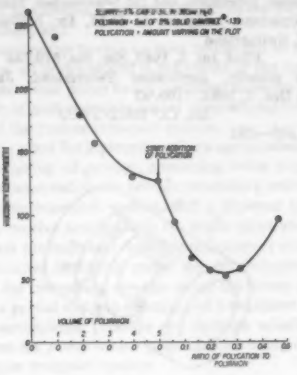
FIBROUS MEDIA CONTAINING MILLIMICRON-SIZED PARTICULATES

Kenneth C. Hou, San Antonio, Tex., assignor to AMF Incorporated, White Plains, N.Y.

Division of Ser. No. 347,360, Feb. 9, 1982,. This application Dec. 6, 1983, Ser. No. 558,453
Int. Cl.³ B01D *15/00*
U.S. Cl. 210—679 **15 Claims**

1. A process of delipidizing a lipid-containing fluid which comprises contacting said fluid with a self supporting fibrous matrix containing immobilized therein at least about 5% by weight of a microparticulate material having an average diameter of less than 1 micron, an organic polycationic resin and an organic polyanionic resin, wherein said resins are present in an amount effective to flocculate said microparticulate material in said matrix.

12. A process for depyrogenating a pyrogen-containing fluid which comprises contacting said fluid with a self supporting fibrous matrix containing immobilized therein at least about 5% by weight of a microparticulate material having an average diameter of less than 1 micron, an organic polycationic resin and an organic polyanionic resin, wherein said resins are present in an amount effective to flocculate said microparticulate material in said matrix.

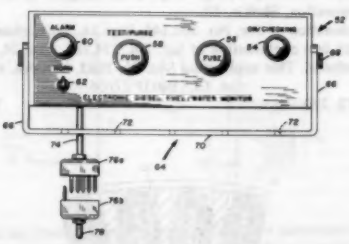


4,488,970

DIESEL FUEL MONITOR SYSTEM, NEGATIVE PRESSURE TYPE

Joseph H. Clark, 4015 Woodley Rd., Ellicott City, Md. 21043

Filed Oct. 14, 1981, Ser. No. 311,393
Int. Cl.³ B03D *3/00*; G08B *21/00*
U.S. Cl. 210—746 **11 Claims**



1. A method for separating, detecting and automatically disposing of an electrically conductive contaminate in the fuel of negative pressure type automotive type fuel systems, comprising, passing said fuel through a separating mechanism to separate said contaminate and accumulate said contaminate at a specified point and location, sensing said fuel and contaminate under negative pressure, passing an electrical current through said contaminate between at least two terminals to complete a circuit, the completion of said circuit causing a valve to open and a negative pressure type pump to operate, whereby said pump sucks said accumulated contaminate through discharge means and directs said contaminate to a point of disposal.

4,488,971

PROCESS FOR EVEN DIVISION OF SUBSTANCES AND MIXTURES OF SUBSTANCES IN THE COURSE OF MANUFACTURE OF PULVERULENT PREPARATIONS BY CHEMICAL REACTION

Friedrich Bölsing, Danziger Str. 5, D-4965-Lindhorst, Fed. Rep. of Germany

Division of Ser. No. 111,977, Jan. 14, 1980, Pat. No. 4,350,598, which is a continuation of Ser. No. 709,385, Jul. 28, 1976, abandoned. This application Aug. 12, 1982, Ser. No. 407,594
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1975, 2533789
The portion of the term of this patent subsequent to Sep. 21, 1999, has been disclaimed.
Int. Cl.³ B01J 20/12; C02C 5/02
U.S. Cl. 210—751 10 Claims

1. A method for forming a uniform distribution of a substance in calcium hydroxide comprising:

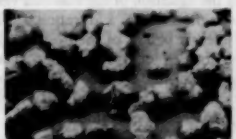
mechanically mixing a substance which is in the presence of water with calcium oxide which is a compound capable of reacting with water to form calcium hydroxide having a surface area greater than the surface area of said calcium oxide, said mechanical mixing homogenizing said calcium oxide, water and said substance such that said substance is homogeneously distributed within said calcium oxide prior to the observation of the temperature increase associated with the exothermic reaction between calcium oxide and water, and said mechanical mixing substantially homogeneously distributes said substance within said calcium oxide at a rate faster than the rate of reaction between water and calcium oxide; said mixing step being performed in the absence of compounds which delay the reaction between said calcium oxide and water to provide said calcium hydroxide; and upon reaction between said calcium oxide and water, a dust-dry substantially uniform distribution of said substance in calcium hydroxide is provided.

4,488,972

BENTONITE AGGLOMERATES

Barry M. Weinstein, Old Bridge, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Apr. 8, 1982, Ser. No. 366,587
Int. Cl.³ C11D 3/08, 3/14, 11/00; D06M 11/06
U.S. Cl. 252—8.6 7 Claims



1. A particulate fabric softener, suitable for incorporation in detergent compositions for softening washed laundry, which consists of agglomerates of finely divided bentonite, essentially all of which passes through a No. 325 sieve, agglomerated to particles which are irregular in shape and craggy in appearance, of sizes essentially in the Nos. 30–100 sieve range, of bulk density in the range of 0.75 to 0.9 g./ml., of moisture content in the range of 11 to 13% and a frangibility less than 25, and include about 2 to 4% of sodium silicate as a binder to assist in maintaining the integrity of the agglomerates until they are added to water, in which they disintegrate and disperse.

4,488,973

PROCESS FOR AUGMENTING OR ENHANCING THE FRESH AIR AROMA OF CONSUMABLE MATERIALS AND CLOTHING AND COMPOSITION USEFUL FOR SAME

Ira D. Hill, Locust; Robert W. Trenkle, Bricktown; Braja D. Mookherjee, Holmdel, and Robin K. Wolff, Point Pleasant, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 535,795, Sep. 26, 1983, , which is a division of Ser. No. 384,959, Jun. 4, 1982, Pat. No. 4,434,086. This application Apr. 6, 1984, Ser. No. 597,412
Int. Cl.³ D06M 13/12, 13/02; A61K 7/035
U.S. Cl. 252—8.6 5 Claims

1. A process for augmenting or enhancing or imparting a fresh air aroma to a perfumed article selected from the group consisting of fabric softener compositions, fabric softener articles, cosmetic powders and hair shampoos comprising the step of adding to said perfumed article an aroma augmenting or enhancing quantity of an aldehyde composition consisting essentially of:

(a) from about 0.5 up to about 5% by weight of said aldehyde composition of n-hexanal;
(b) from about 2 up to about 12% by weight of said aldehyde composition of n-heptanal;
(c) from about 5 up to about 15% by weight of said aldehyde composition of n-octanal;
(d) from about 40 up to about 70% by weight of said aldehyde composition of n-nonanal;
(e) from about 10 up to about 30% by weight of said aldehyde composition of n-decanal;
(f) from about 0.5 up to about 5% by weight of said aldehyde composition of n-undecanal;
(g) from about 0.5 up to about 5% by weight of said aldehyde composition of n-dodecanal;
(h) from about 0.5 up to about 5% by weight of said aldehyde composition of n-tridecanal;
(i) from about 0 up to about 5% by weight of said aldehyde composition of n-tetradecanal;
(j) from about 0 up to about 5% by weight of said aldehyde composition of n-pentadecanal.

4,488,974

SOFTENER EMULSION, A PROCESS FOR ITS PREPARATION, AND ITS APPLICATION

Karl-Heinz Keil, Hanau-Mittelbuchen; Ulrich Greiner, Schöneck; Georg-Wolfgang Eckardt, Frankfurt am Main, and Volker Köhler, Niedernhausen, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 17, 1983, Ser. No. 552,723
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1982, 3244265
Int. Cl.³ D06M 13/16, 13/18, 13/40
U.S. Cl. 252—8.8 10 Claims

1. A softener emulsion containing:

46 to 84.25% by weight of water;

15 to 35% by weight of a mixture of nitrogen-containing compounds comprising:

a mol % of $R—NH—CO—NH—CH_2—(O—CH_2—CH_2-)_n—OR^1$,

b mol % of $R^2—CO—NH—CH_2—(O—CH_2—CH_2)_n—OR^1$,

c mol % of $R—NH—CO—NH—CH_2OH$,

d mol % of $R^2—CO—NH—CH_2OH$;

0.5 to 6% by weight of at least one anionic emulsifier;

0.25 to 3% by weight of at least one alkaline earth metal ion in the form of at least one soluble alkaline earth metal compound; and

0 to 10% by weight of at least one solvent completely miscible with water;

wherein

a is from 10 to 96,

b is from 0.7 to 50,

c is from zero to 77, and
d is from zero to 40,
with the proviso that
a+b+c+d is 100,
(a+c):(b+d) is 1:(1 to 0.04), and
(a+b):(a+b+c+d) is 1:(1 to 5), and
wherein
R is alkyl having 12 to 22 carbon atoms,
R^1 is alkyl having 1 to 4 carbon atoms,
R^2 is alkyl having 12 to 30 carbon atoms, and
n is a number from 1 to 3.

4,488,975

HIGH TEMPERATURE STABLE CROSSLINKED GEL FRACTURING FLUID

Stephen W. Almond, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Dec. 13, 1982, Ser. No. 449,094
Int. Cl.³ E21B *43/26*
U.S. Cl. 252—8.55 R **17 Claims**

1. A crosslinked gel fracturing fluid consisting essentially of:
an aqueous fluid;
a gelling agent comprising at least one member selected from the group consisting of karaya, xanthan, tragacanth, gum ghatti, carrageenin, psyllium, gum acacia, carboxyalkylguar, carboxyalkylhydroxyalkylguar, carboxyalkylcellulose, carboxyalkylhydroxyalkylcellulose wherein said alkyl radicals are methyl, ethyl or propyl radicals, polyacrylates, polymethacrylates, acrylamide-acrylate copolymers and maleic anhydride-methyl vinyl ether copolymers present in an amount of from about 10 pounds to about 100 pounds per 1,000 gallons of aqueous fluid;
a crosslinking agent selected from the group consisting of zirconium chelates which features zirconium in the +4 oxidation state and aluminum chelates which feature aluminum in the +3 oxidation state present in an amount of from about 0.01 to 10 pounds per 1,000 gallons of aqueous fluid; and
a sufficient quantity of carbon dioxide to reduce the pH of said fracturing fluid to a level below about 5.5 whereby said gelling agent is caused to be controllably crosslinked by said crosslinking agent without significant syneresis of said crosslinked gel occurring.

4,488,976

OLEFIN SULFONATE-IMPROVED STEAM FOAM DRIVE

Richard E. Dilgren, Houston, and Kenneth B. Owens, Spring, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 247,425, Mar. 25, 1981, Pat. No. 4,393,937.
This application Jun. 1, 1983, Ser. No. 500,195
Int. Cl.³ E21B *43/24*
U.S. Cl. 252—8.55 D **5 Claims**

1. A process for formulating a steam-foam-forming injection mixture to be injected into an oil-containing subterranean reservoir, comprising:
measuring steady state pressures developed by fluid flowing upward past vertically spaced locations within a permeable material which contains a steam residual oil saturation of the reservoir oil, or an equivalent oil, where said fluid is steam of the quality to be injected into the reservoir and is flowed at a rate substantially equalling the near-well flow rate at which said injection mixture is to be injected into the reservoir;
measuring said pressures developed by comparable flows of the same steam mixed with at least one surfactnat for forming a steam foam;
determining from ratios of said measured pressures the permeability reduction factor provided by the mixture of the steam with at least one surfactant; and
formulating, as said injection mixture, a mixture of said steam with a surfactant which, in contact with the reservoir oil, is capable of providing a permeability reduction factor of less than about 0.18 but is capable of flowing into the reservoir in response to an injection pressure which is less than the fracturing pressure of the reservoir.

4,488,977

HIGH TEMPERATURE SELF LUBRICATING BEARING

Mihai D. Patrichi, Los Angeles, Calif., assignor to Networks Electronic Corp., Chatsworth, Calif.

Filed Nov. 15, 1982, Ser. No. 441,928
Int. Cl.³ C10M *7/02*
U.S. Cl. 252—12.4 **8 Claims**

1. A self lubricating bearing comprising male and female members;
and a coating of lubricating material on the bearing surface of at least one of said members, said coating comprising a mixture of finely powdered metals in polyimide resin, said metals comprising a ductile metal and a wear resistant load bearing metal, said ductile metal comprising gold or silver, said load bearing metal comprising tungsten or nickel, said powdered metals being in the form of particles of 0.8 micron size or smaller, wherein said powdered metals being mixed in said resin in such quantities to have said load bearing metal form a nucleus around which said ductile metal will agglomerate, said coating being applied and cured at high temperature.

4,488,978

COARSE-PARTICLE CALCIUM/MAGNESIUM ACETATE SUITABLE FOR ROADWAY AND WALKWAY DEICING, AND PROCESS FOR ITS MANUFACTURE

Alan B. Gancy, 265 Robineau Rd., Syracuse, N.Y. 13207

Filed Feb. 10, 1983, Ser. No. 448,625
Int. Cl.³ C09K *3/18*
U.S. Cl. 252—70 **4 Claims**

1. A process for the manufacture of calcium/magnesium acetate coarse particles suitable for roadway deicing comprising the following steps:
(a) combining aqueous acetic acid with the stoichiometric requirement of lime in an agitated reaction vessel to form the calcium/magnesium acetate reaction batch;
(b) controlling the water content of said reaction batch such that the mol ratio of water to calcium acetate contained therein does not exceed about 3.3;
(c) controlling the concentration of aqueous acetic acid between the limits 84–100%;
(d) controlling the mol ratio of magnesium to calcium in the lime between the limits 0–1;
(e) controlling the agitation of the reaction vessel, and carrying out the agitation for a duration sufficient to form coarse particles or pellets of the desired size; and
(f) drying the formed coarse particles in a conventional manner such that the residual water content of dried coarse particles be no less than 0.1–0.2 mols of water per mol of calcium acetate contained therein.

4,488,979

HYDRAULIC FLUID

Rudolf Baur, Kreuzlingen, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Feb. 7, 1983, Ser. No. 464,326
Claims priority, application Switzerland, Feb. 23, 1982, 1091/82
Int. Cl.³ C10M *3/12, 3/16*
U.S. Cl. 252—79 **8 Claims**

1. A hydraulic fluid characterized by good compatibility with rolled aluminum surfaces containing 100 parts by weight of polyisobutylene, 3 to 15 parts by weight of butylstearate and 0.5 to 5 parts by weight of palm seed oil, wherein said polyisobutylene is a mixture of polyisobutylenes with all components having an average molecular weight of about 320 and above.

4,488,980

DETERGENT COMPOSITIONS

John Oakes, South Wirral, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Dec. 8, 1983, Ser. No. 559,592

Claims priority, application United Kingdom, Dec. 17, 1982, 8236006

Int. Cl.³ C11D 3/04; D06L 3/02

U.S. Cl. 252—99 5 Claims

1. A built detergent bleach composition comprising from 2–50% by weight of a surface-active agent selected from anionic, nonionic, zwitterionic and cationic detergents and mixtures thereof; 4–50% by weight of a peroxide compound bleach; 5–80% by weight of a builder mixture comprising essentially a condensed phosphate and an alkalimetal orthophosphate in a weight ratio of from 10:1 to 1:60, and a manganese compound which delivers manganese (II) ions in aqueous solution, in an amount of 0.005 to 2.5% by weight as manganese (II) metal based on the total detergent composition.

4,488,981

LOWER ALKYL GLYCOSIDES TO REDUCE VISCOSITY IN AQUEOUS LIQUID DETERGENTS

Allen D. Urfer, Decatur; Leonard F. VanderBurgh, Bethany, and Robert S. McDaniel, Jr., Decatur, all of Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Sep. 6, 1983, Ser. No. 529,435

Int. Cl.³ C11D 1/66, 1/831, 3/22, 17/08

U.S. Cl. 252—174.17 18 Claims

1. A process for reducing the viscosity of, and for preventing phase separation in, an aqueous liquid detergent having an initial viscosity of at least about 350 cps which comprises adding to an aqueous liquid detergent about 1 to 10 weight percent of a lower alkyl glycoside represented by the formula R—O—(G)$_n$ where "R" is a lower alkyl group having 2 to 5 carbon atoms, "O" is an oxygen atom, "G" is a saccharide unit, and "n" is a number from 1 to 10.

10. A single-phase aqueous liquid detergent composition having a viscosity at 25° C. of about 70 to 350 cps. which comprises about 1 to 10 weight percent of a lower alkyl glycoside represented by the formula R—O—(G)$_n$ where "R" is a lower alkyl group having 2 to 5 carbon atoms, "O" is an oxygen atom, "G" is a saccharide unit, and "n" is a number from 1 to 10 said detergent having a viscosity of at least about 350 cps in the absence of the glycoside.

4,488,982

LOW FOAMING NONIONIC POLYETHER POLYCARBONATE SURFACTANTS AND FUNCTIONAL FLUIDS

Michael Cuscurida, and Robert M. Gipson, both of Austin, Tex., assignors to Texaco Development Corp., White Plains, N.J.

Continuation of Ser. No. 171,504, Jul. 23, 1980, abandoned, which is a continuation of Ser. No. 25,424, Mar. 30, 1979, abandoned. This application Jun. 19, 1981, Ser. No. 275,468

Int. Cl.³ C11D 1/72, 1/875; C07C 69/00

U.S. Cl. 252—174.21 10 Claims

1. A mixture of low foaming aliphatic polyether-carbonate compounds for use as surface active agents or functional fluids, such compounds consisting of:

(a) an initiator compound segment derived from an initiator compound having a single reactive hydroxyl or carboxyl group attached to an alkyl or alkylphenyl group, or an alkylene oxide adduct thereof; and

(b) an alkoxycarbonyl chain group attached to the initiator compound at the site of the hydroxyl or carboxyl group by the reaction of an alkylene carbonate having from 2 to 6 carbon atoms or a mixture of an alkylene oxide, having 2 to 5 carbon atoms, and carbon dioxide at the ratio of from 1 to 10 moles of the alkylene oxide per mole of carbon dioxide; wherein there is present an average of from 1 to 30 carbonyl groups in the alkoxycarbonyl chain segment per mole of initiator compound.

4,488,983

PREPARATION OF LANTHANUM BISMUTH OXYCHLORIDE PHOSPHORS

Lothar H. Brixner, West Chester, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 22, 1983, Ser. No. 487,895

Int. Cl.³ C09K 11/475

U.S. Cl. 252—301.4 H 4 Claims

1. A process for preparing a lanthanum bismuth oxychloride phosphor of the formula $La_{1-x-y}Bi_xRE_yOCl$, where RE is one or more of the rare earth elements, x is 0.001 to about 0.25, and y is 0 to 0.005, said process comprising

(a) mixing intimately stoichiometric quantities of La_2O_3, Bi_2O_3, and a rare earth oxide of formula RE_2O_3, together with NH_4Cl and a flux comprising $BaCl_2$, where quantities of NH_4Cl and $BaCl_2$, by weight, are each from about one-third to about one-half that of the combined weights of La_2O_3, Bi_2O_3, and RE_2O_3;

(b) firing said mixture according to a time/temperature sequence in which the mixture is heated in an inert container and in air

(1) from 1 to about 4 hours at about 275° C. to 325° C. to form lanthanum bismuth oxychloride,

(2) from about 2 to about 4 hours at about 275° C. to 500° C. to volatilize the remaining NH_4Cl, and

(3) from about 8 to 10 hours at about 800° C. to 1000° C., and

(c) recovering said phosphor from said mixture by washing the mixture with water.

4,488,984

SELF-DISPERSING ANTIMONY OXIDE SOLS

Morris Kaplan, Houston, Tex., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Jul. 5, 1983, Ser. No. 510,806

Int. Cl.³ B01J 20/12

U.S. Cl. 252—313 R 2 Claims

1. An aqueous antimony sol composition useful in restoring the activity of metal contaminated molecular sieve cracking catalysts which comprises a major portion of an aqueous antimony sol containing between 1–50% by weight of antimony oxide as Sb_2O_5 and between 0.1–10% by weight of a compatible water-soluble surfactant which is capable of producing an oil-in-water emulsion and having an hydrophile-lipophile-balance of at least 8.0.

4,488,985

PHOSPHORAMIDATES CONTAINING A P-PHENYLENEDIAMINE GROUP

Paul K. Battey, Harrogate, and Peter Hope, Hollingworth Lake, both of England, assignors to Akzona Incorporated, Enka, N.C.

Division of Ser. No. 399,580, Jul. 19, 1982, Pat. No. 4,418,022. This application Jul. 21, 1983, Ser. No. 516,143

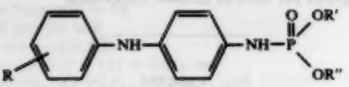
Claims priority, application Netherlands, Jul. 20, 1981, 8103418

Int. Cl.³ C09K 15/32; C08K 5/49

U.S. Cl. 252—400 A 33 Claims

1. A composition for stabilizing an organic material such as waxes, natural and synthetic rubbers, synthetic resins, and lubricating oils, comprising:

(a) a phosphoramidate compound of the general formula:



wherein R is a hydrogen atom, a straight-chain or branched-chain alkyl or alkoxy group, or cycloalkyl or cycloalkoxy group containing from 5 to 8 carbon atoms, and wherein R' and R'' may be the same or different and each represents a substituted or unsubstituted straight-chain or branched-chain alkyl group having 1 to 22 carbon atoms, a substituted or unsubstituted cycloalkyl group having 5 to 8 carbon atoms, an alkenyl group having 3 to 22 carbon atoms, a substituted or unsubstituted phenyl group, an alkylphenyl group containing from 7 to 14 carbon atoms, or an aralkyl group containing from 7 to 15 carbon atoms, or alternatively wherein R' and R'' together are a 1,2- or 1,3-alkylene group containing from 2 to 8 carbon atoms or an o-arylene group containing from 6 to 10 carbon atoms; and

(b) a synergistic amount of a sulfur compound.

4,488,986

PREPARATION OF ELECTRICALLY CONDUCTIVE POLYARYLENE COMPOUNDS HAVING ELECTRON-ATTRACTING SIDE GROUPS

Herbert Naarmann, Wattenheim; Petr Simak, and Gernot Köhler, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

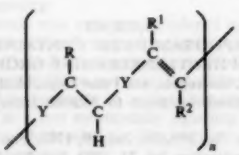
Filed Aug. 2, 1983, Ser. No. 519,507

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1982, 3228880

Int. Cl.³ H01B 1/06

U.S. Cl. 252—500 **5 Claims**

1. A process for the preparation of an electrically conductive polymeric system having an electrical conductivity greater than 10^{-4} S/cm which comprises: treating a polyarylene compound, in the absence of moisture and oxygen, with from 0.03 to 0.9 mole percent, based on the polyarylene compound employed, of a complexing agent of the group of strong Lewis acids having a pK_a of from -10 to $+4$ or sodium or potassium, wherein the polyarylene compound employed contains one or more chain members of the formula



where n is greater than 1 and not greater than 50, R is a carbonnitrile, carboxylicamide, carboxylic or caboxylic ester group, R^1 and R^2 are each hydrogen or a carbonitrile, carboxylamide, carboxylic or carboxylic ester group, with the proviso that in each case one of the radicals R^1 and R^2 is hydrogen and the other is a nitrile, acid amide, carboxyl or ester group, and Y is a phenylene or diphenylene radical.

4,488,987

DOPED POLYMERIC ORGANIC ELECTRICAL CONDUCTORS AND A PROCESS FOR THEIR MANUFACTURE

Jürgen Hocker, Bergisch-Gladbach; Rolf Dhein, Krefeld, and Rudolf Merten, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen

Filed Nov. 22, 1982, Ser. No. 443,202

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1981, 3147476

Int. Cl.³ H01B 1/06

U.S. Cl. 252—520 **2 Claims**

1. A process for increasing the electrical conductivity in a conjugated organic polymer selected from the group consisting of polyacetylene, polyphenylene, polyphenylene sulphide, polypyrrole and polythiophene which comprises oxidizing said conjugated organic polymer with a salt of tetravalent titanium or tin which is soluble in an organic solvent or readily sublimable and is present in an amount of from 0.1 to 200% by weight, based on said conjugated organic polymer, at a temperature of $-80°$ to 200° C.

4,488,988

METHYL CARBONATE OF α,3,3-TRIMETHYL CYCLOHEXANE METHANOL, ORGANOLEPTIC USES THEREOF AND PROCESS FOR PREPARING SAME

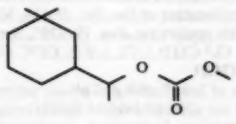
Michael Licciardello, Little Silver, and Richard M. Boden, Ocean, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 474,158, Mar. 10, 1983, Pat. No. 4,435,331. This application Sep. 14, 1983, Ser. No. 532,001

Int. Cl.³ C11B 9/00

U.S. Cl. 252—522 R **5 Claims**

1. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, colognes and perfumed articles comprising the step of intimately admixing with a perfume composition base, a cologne base or a perfumed article base, an aroma augmenting or enhancing quantity of the methyl carbonate of α,3,3-trimethyl cyclohexane methanol having the structure:



4,488,989

AQUEOUS COMPOSITIONS CONTAINING UREA AS A HYDROTROPE

Vincent Lamberti, Upper Saddle River, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed Nov. 14, 1983, Ser. No. 551,230

Int. Cl.³ C11D 7/52

U.S. Cl. 252—541 **15 Claims**

1. An aqueous composition of improved pH storage stability comprising urea which further comprises an effective amount

of a hydrolyzable ester of a Lowry-Bronsted acid which has at least one acidity constant pK_a in the range of about 2 to about 4 sufficient to neutralized any ammonia liberated by decomposition of urea.

4,488,990

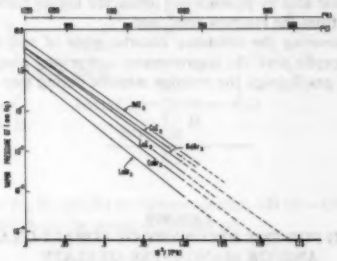
SYNTHETIC MONAZITE COATED NUCLEAR WASTE CONTAINING GLASS

Lympexios N. Yannopoulos, Churchill, Pa., assignor to Westinghouse Electric Corp., Pittsburth, Pa.

Division of Ser. No. 245,488, Mar. 19, 1981, Pat. No. 4,382,974. This application Feb. 15, 1983, Ser. No. 466,463

Int. Cl.³ A61N *5/12*

U.S. Cl. 252—629 **5 Claims**



1. A stabilized nuclear waste product comprising nuclear waste containing glass coated with synthetic monazite.

4,488,991

BACTERIAL TOXOIDS AND GRAM-NEGATIVE IMMUNE GLOBULIN THEREFROM

Richard L. Tolman, Warren; Stephen Marburg, Metuchen, both of N.J., and Lynn T. Callahan, III, North Wales, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 358,133, Mar. 15, 1982, Pat. No. 4,428,931. This application Oct. 26, 1983, Ser. No. 545,565

Int. Cl.³ C07G *7/00*; A61K *39/104*

U.S. Cl. 260—112 R **3 Claims**

1. A process for preparing toxoids which comprises:

(1) mixing and ADP-ribosylating toxin with a photolabile affinity reagent selected from the group consisting of 8-azidoadenosine and 8-azidoadenine, at about 0° C. under an inert atmosphere, and

(2) exposing the mixture of step 1 to an effective amount of nondenaturing light.

4,488,992

MONOAZO DYESTUFFS DERIVED FROM BENZOTHIAZOLE

Kenji Yoshinaga, Toyonaka; Kiyoyasu Hashimoto, Ibaraki; Tetsuo Okaniwa, Amagasaki, and Hirohito Kenmochi, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

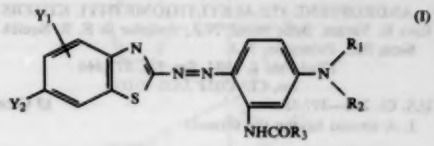
Filed Dec. 6, 1979, Ser. No. 100,911

Claims priority, application Japan, Dec. 25, 1978, 53-163617; Oct. 3, 1979, 54-128308

Int. Cl.³ C07D *277/82*; C09B *29/08*

U.S. Cl. 534—788 **3 Claims**

1. A disperse dye of the formula (I):



(I)

wherein R_1 is an alkyl group having 5 to 6 carbon atoms, R_2 is a cyanoethyl group, R_3 is a lower alkyl group, Y_1 is a hydrogen atom at the 4- or 5-position, and Y_2 is a halogen atom.

4,488,993

AMIDINOUREAS

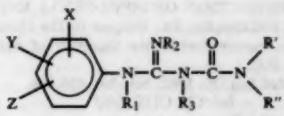
George H. Douglas, Paoli, and Julius Diamond, Lafayette Hill, both of Pa., assignors to William H. Rorer, Inc., Fort Washington, PA 19034

Continuation of Ser. No. 178,426, Aug. 15, 1980, abandoned, which is a division of Ser. No. 925,145, Jul. 17, 1978, Pat. No. 4,220,658, which is a continuation of Ser. No. 805,371, Jun. 10, 1977, abandoned, which is a continuation of Ser. No. 687,266, May 17, 1976, abandoned, which is a continuation of Ser. No. 385,797, Aug. 6, 1973, abandoned, which is a continuation-in-part of Ser. No. 291,474, Sep. 22, 1972, abandoned. This application Oct. 25, 1982, Ser. No. 436,490

Int. Cl.³ C07C *127/19*; C07D *205/06*

U.S. Cl. 260—239 A **2 Claims**

1. A compound of the formula



I.

where:

X is in the 6-position and is, halo;

Y is in the 4-position and is halo, or loweralkyl;

Z is in the 2-position and is halo;

R_1, R_2 and R_3 are hydrogen or loweralkyl;

R′ and R″ are hydrogen, loweralkenyl, cycloalkyl, cycloalkylloweralkyl, aralkyl, cycloalkenyl or

R′ and R″ together are loweralkylidenyl or heteroloweralkylidenyl, provided R_1, R_2, R_3, R′ and R″ are not all hydrogen at the same time; and

the non-toxic acid addition salts thereof.

4,488,994

BIS-ESTERS OF METHANEDIOL WITH PENICILLINS AND PENICILLANIC ACID 1,1-DIOXIDE

Eric C. Bigham, Chapel Hill, N.C., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 185,090, Sep. 8, 1980, Pat. No. 4,377,524, which is a division of Ser. No. 039,539, May 16, 1979, Pat. No. 4,244,951. This application Feb. 16, 1982, Ser. No. 348,881

The portion of the term of this patent subsequent to Jan. 13, 1998, has been disclaimed.

Int. Cl.³ C07D *499/32*

U.S. Cl. 260—239.1 **1 Claim**

1. The 4-toluenesulfonate salt of 6′-(2-amino-2-phenylacetamido)penicillanoyloxymethyl penicillanate 1,1-dioxide.

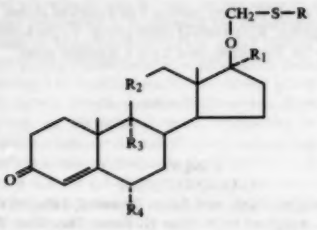
4,488,995

ANDROSTENE-17β-ALKYLTHIOMETHYL ETHERS

Ravi K. Varma, Belle Mead, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 6, 1984, Ser. No. 577,444
Int. Cl.³ C07J 1/00, 7/00
U.S. Cl. 260—397.45 13 Claims

1. A steroid having the formula



or a 1,2-dehydro derivative thereof, wherein
R is alkyl;
R_1 is hydrogen, alkyl, alkenyl, alkynyl, or aryl;
R_2 is carbonyl or β-hydroxymethylene;
R_3 is hydrogen or halogen; and
R_4 is hydrogen, methyl or fluorine.

4,488,996

RAPID PRODUCTION OF ISPROPENYL ESTERS

Samuel Serota, Philadelphia, Pa., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sep. 29, 1982, Ser. No. 426,438
Int. Cl.³ C11C 3/02
U.S. Cl. 260—410.9 R 9 Claims

1. A process for preparing rapidly an isopropenyl ester comprising reacting a fatty acid with propyne in the presence of a loaded zeolite catalyst.

4,488,997

METHOD FOR THE PREPARATION OF HIGHER ANTIMONY TRICARBOXYLATES

Richard F. Miller, and John Link, both of Humble, Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 27, 1982, Ser. No. 412,409
Int. Cl.³ C11C 1/00
U.S. Cl. 260—414 2 Claims

1. Antimony tricarboxylate having a mixture of neodecanoate ligands and 2-ethylhexanoate ligands prepared by the process comprising the steps of:
(a) forming an antimony tricarboxylate by reacting antimony oxide with an anhydride of a lower organic acid at an elevated temperature,
(b) reacting the product from (a) with neodecanoic acid and 2-ethylhexanoic acid at a temperature sufficiently high to replace substantially all of the lower organic acid radicals with neodecanoic acid and 2-ethylhexanoic acid radicals and remove the lower organic acid by-product and unreacted neodecanoic acid and 2-ethylhexanoic acid from the reaction zone, and
(c) recovering the mixed antimony carboxylate of neodecanoic acid and 2-ethylhexanoic acid.

4,488,998

PREPARATION OF HIGHER ANTIMONY TRICARBOXYLATES IN IMPROVED YIELDS USING AN INERT GAS

Richard F. Miller, and John Link, both of Humble, Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 27, 1982, Ser. No. 412,419
Int. Cl.³ C11C 1/00
U.S. Cl. 260—414 14 Claims

1. In a method of producing higher tricarboxylates of antimony comprising the steps of
(a) forming an antimony tricarboxylate by reacting antimony oxide with an anhydride of a lower organic acid at an elevated temperature,
(b) reacting the product from (a) with at least one higher carboxylic acid at a temperature sufficiently high to replace substantially all of the lower organic acid radicals with higher carboxylic acid radicals and remove the lower organic acid by-product and unreacted higher carboxylic acid from the reaction zone, and
(c) recovering the antimony tricarboxylate of said higher carboxylic acid, the improvement comprising passing an inert gas through the reaction mixture during step (b).

4,488,999

METHOD FOR THE RECOVERY OF COBALT OXALATE AND/OR MANGANESE OXALATE

Marcel Feld, Cologne, Fed. Rep. of Germany, assignor to Dynamit Nobel AG, Troisdorf, Fed. Rep. of Germany

Filed Feb. 1, 1983, Ser. No. 462,861
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1982, 3203658
Int. Cl.³ C07F 13/00, 5/06
U.S. Cl. 260—429 R 4 Claims

1. A process for recovering cobalt and/or manganese as the oxalates from solution, in acetic acid, organic solvent or solvent mixtures or extracts, which is at least partially miscible with water, comprising mixing the solution of extract with 1 or 2 moles in solid form of sodium, potassium or ammonium oxalate while maintaining the mixture at a temperature in the range of from about 50° C. to about 160° C. and at a water content of 5 to 90 weight-percent if sodium oxalate is used, 2 to 15 weight-percent if potassium oxalate is used, or 1 to 12 weight-percent if ammonium oxalate is used, thereby to form an easily filterable suspension of cobalt and/or manganese oxalate.

4,489,000

PROCESS FOR THE PREPARATION OF CERIC ALKOXIDES

Peter S. Gradeff, Pottersville, and Fred G. Schreiber, Highland Park, both of N.J., assignors to Rhone-Poulenc Inc., New Brunswick, N.J.

Filed Aug. 9, 1983, Ser. No. 521,787
Int. Cl.³ C07F 5/00
U.S. Cl. 260—429.2 15 Claims

1. A process for preparing ceric alkoxides which comprises reacting ceric ammonium nitrate with an alcohol under anhydrous conditions in the presence of an anhydrous base at a temperature within the range from about −30° C. to about 200° C. until ceric alkoxide and the nitrate salt of the base are formed.

4,489,001

ACIDIC PHALLOTOXIN DERIVATIVES AND METHODS OF PREPARATION

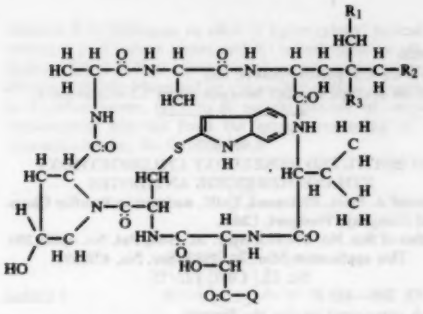
Lawrence S. Barak, West Bloomfield, Mich.; Eugene A. Nothnagel, Litchfield, Minn.; Watt W. Webb, Ithaca, N.Y., and Robert R. Yocum, Cambridge, Mass., assignors to Cornell Research Foundation, Inc., New York, N.Y.

Division of Ser. No. 124,208, Feb. 25, 1980, Pat. No. 4,387,088. This application Mar. 18, 1983, Ser. No. 476,659

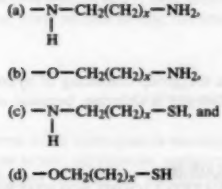
Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R **4 Claims**

1. A compound corresponding to the formula:



wherein R_1, R_2 and R_3 are independently —H or —OH and Q is selected from the group consisting of:



where x is 0 or a whole number.

4,489,002

AZO COMPOUND AND AN AZOMETHINE COMPOUND AND HAVING A TERTIARY N-DATIVE BOND

Hans Baumann, Wachenheim, and Klaus Grychtol, Bad Durkheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

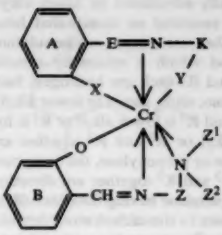
Filed Jun. 4, 1982, Ser. No. 384,945

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1981, 3123969

Int. Cl.³ C09B *45/02, 45/06, 45/16, 45/48*

U.S. Cl. 534—695 **4 Claims**

1. An asymmetrical 1:2 chromium complex of the formula



wherein:

E is —CH+ of —N=,

K is the radical of a benzene, naphthalene, pyrazole, pyridine, pyrimidine, quinoline or isoquinoline, which is unsubstituted or substituted at the ortho position with a complex forming residue selected from an alkoxy, hydroxyl or carboxyl group,

X is —O— or —COO—,

Y is —O—, —COO— or —NH—,

Z^1 and Z^2 independently of one another are C_1–C_{20} alkyl which is unsubstituted or substituted with hydroxyl, C_1–C_8-alkoxy or phenoxy, C_5–C_7 cycloalkyl or phenyl which is unsubstituted or substituted with chlorine, bromine, methyl, ethyl, methoxy, ethoxy, pyrrolidino, piperidino, morpholino, methyl-morpholino, dimethylmorpholino, N-methylpiperazino, N-(β-hydroxyethyl)-piperazino, thiomorpholino-2-dioxide or hexamethyleneimino, or

Z^1 and Z^2 together form a N-containing heterocyclic radical, and

Z is C_2–C_3 alkylene;

wherein rings A, B or K have from 1 to 4 sulfonic acid groups, and rings A and B are a phenyl or naphthyl which, independently of each other are unsubstituted or substituted with hydrogen, hydroxysulfonyl, chlorine, bromine, methyl, methoxy, ethoxy, nitro, methylsulfonyl, ethyl-sulfonyl, sulfamyl, N-mono- or N,N-di-C_1–C_4-alkyl-substituted sulfamyl or N-phenylsulfamyl, hydroxysulfonyl, or phenylazo which is unsubstituted or substituted by chlorine, methyl, methoxy or hydroxysulfonyl.

4,489,003

IMIDAZOBENZODIAZEPINES

Walter Hunkeler, Magden, and Emilio Kyburz, Reinach, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

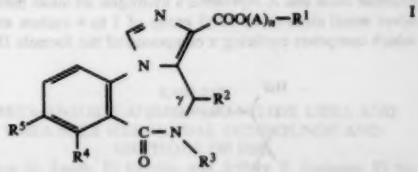
Filed Jul. 14, 1983, Ser. No. 513,571

Claims priority, application Switzerland, Jul. 21, 1982, 4460/82

Int. Cl.³ C07D *471/14, 471/22, 513/22;* **A61K** *31/55*

U.S. Cl. 260—239.3 P **22 Claims**

1. A compound of the formula



I

wherein A is lower alkylene, n is zero or 1, R^1 is selected from the group consisting of lower alkynyl, lower alkenyl, phenyl optionally substituted by halogen, lower alkyloxy, lower alkyl, trifluoromethyl or nitro, (C_{3-8})-cycloalkyl

optionally substituted by lower alkyl or (C_{5-8})-cycloalkenyl optionally substituted by lower alkyl, or a 5- or 6-membered saturated or unsaturated heterocycle which contains either one oxygen or one sulphur atom as a ring member and which is optionally substituted by lower alkyl, R^4 and R^5 each are hydrogen, halogen, trifluoromethyl, cyano, nitro, amino or lower alkyl and either R^2 is hydrogen and R^3 is lower alkyl or R^2 is hydrogen and R^3 is lower alkyl or R^2 and R^3 together are dimethylene, trimethylene or propenylene, the compounds of formula I in which R^2 and R^3 together are dimethylene, trimethylene or propenylene having the (S) or (R,S) configuration with reference to the carbon atom denoted by γ,

and pharmaceutically acceptable acid addition salts thereof.

11. A compound of claim **1**: (R,S)-2cyclohexen-1-yl(S)8-chloro-11,12,13,13a-tetrahydro-9-oxo-9H-imidazo[1,5-a]pyrrolo[2,1-c][1,4]benzodiazepine-1-carboxylate.

4,489,004

PROCESS FOR FORMING VANADIUM PHOSPHORODITHIOATE COMPOUNDS

Carl C. Greco, Garnerville, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Nov. 8, 1982, Ser. No. 439,708

Int. Cl.³ C07F *9/00*

U.S. Cl. 260—429 R **15 Claims**

1. A process for the formation of vanadium dialkyl phosphorodithioate compounds by reaction of a dialkyl phosphorodithioic acid with a vanadium halide in the presence of a substance capable of removing by-product hydrogen halide from the reaction medium.

4,489,005

PROCESS FOR THE PREPARATION OF CYCLOPROPANE COMPOUNDS

Gary Scholes, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 15, 1983, Ser. No. 532,413

Claims priority, application United Kingdom, Sep. 22, 1982, 8227086

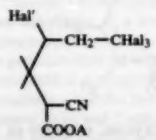
Int. Cl.³ C07F *1/10*; C07C *121/46*

U.S. Cl. 260—430 **9 Claims**

1. A process for the preparation of a compound of the formula I

(I)

in which each Hal independently represents a chlorine or bromine atom and A represents a hydrogen, an alkali metal or silver metal atom or an alkyl group of 1 to 4 carbon atoms, which comprises cyclizing a compound of the formula III



(III)

in which Hal' represents a chlorine or bromine atom, in the presence of a Lewis acid.

4,489,006

IODOPENTAHYDROPERFLUOROALKYL BORATES

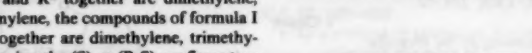
Stanley E. Krahler, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 470,174, Feb. 28, 1983, abandoned. This application Apr. 12, 1984, Ser. No. 599,212

Int. Cl.³ C07F *5/02*

U.S. Cl. 260—462 R **19 Claims**

1. A borate or mixture of borates represented by the formula:



I

wherein

R_f is C_4–C_{20} perfluoroalkyl; and

n is an average number between about 1.5 and about 3.

4,489,007

SUBSTITUTED BENZYLOXY CHLOROETHOXY ETHANE HERBICIDE ANTIDOTES

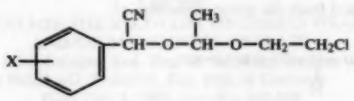
Raymond A. Felix, Richmond, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 244,453, Mar. 16, 1981, Pat. No. 4,400,204. This application Mar. 24, 1983, Ser. No. 478,392

Int. Cl.³ C07C *121/75*

U.S. Cl. 260—465 F **3 Claims**

1. A compound having the formula



in which X is selected from the group consisting of hydrogen and halogen wherein the halogen is chlorine, bromine or iodine.

4,489,008

HYDROXYL-TERMINATED LIQUID POLYMERS

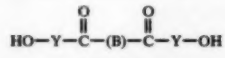
Changkiu K. Riew, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 167,980, Jul. 14, 1980, abandoned, and a continuation-in-part of Ser. No. 952,165, Oct. 17, 1978, abandoned. This application Aug. 9, 1982, Ser. No. 406,134

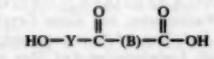
Int. Cl.³ C07C *121/66, 121/46, 121/417*

U.S. Cl. 260—465.4 **6 Claims**

1. A hydroxyl-terminated liquid polymer consisting essentially of more than 75 weight percent of molecules having the formula

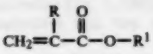


and less than 25 weight percent of the molecules of the formula

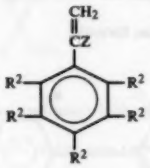


wherein Y is a univalent radical of an aminoalcohol selected from the group consisting of aminoalkanols containing 2 to 12 carbon atoms and aminocycloalkanols containing 6 to 12 carbon atoms, and one primary or secondary hydroxyl group and one primary or secondary amine group in the aminoalcohol molecule as the sole reactive groups in the said aminoalcohol

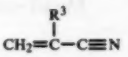
molecule, and (B) is a polymer backbone consisting of carbon-carbon linkages of (1) 60 to 100 percent by weight of vinylidene monomers selected from the group consisting of monoolefins containing 2 to 14 carbon atoms, dienes containing 4 to 10 carbon atoms, vinyl alkyl ketones wherein the alkyl radicals contain 1 to 8 carbon atoms, vinyl and allyl alkyl ethers wherein the alkyl radicals contain 1 to 8 carbon atoms, acrylic acids and acrylates having the formula



wherein R is hydrogen, an alkyl or hydroxylakyl radical containing 1 to 3 carbon atoms and R^1 is hydrogen, an alkyl or hydroxylalkyl radical containing 1 to 18 carbon atoms, an alkoxyalkyl, alkylthioalkyl or cyanoalkyl radical containing 2 to 8 carbon atoms, (2) 0 to 40 weight percent of vinylidene comonomers selected from the groups consisting of vinyl aromatics having the formula



wherein Z is hydrogen or methyl, R^2 is hydrogen, halogen or an alkyl or hydroxyalkyl radical containing from 1 to 4 carbon atoms; vinyl nitriles having the formula



wherein R^3 is hydrogen or an alkyl radical containing 1 to 3 carbon atoms; acrylamide, methacrylamide, N-methylol acrylamide and N-methylol methacrylamide; hydroxy-containing vinylidene monomers selected from the group consisting of allyl alcohol, vinyl benzyl alcohol vinyl acetate, vinyl maleate, and vinyl fumarate; vinyl and vinylidene halides; and (3) 0 to 20 weight percent of vinylidene monomers selected from the group consisting of acrolein, methacrolein divinyl ether, methallyl chloride, itaconic acid, vinyl chloroacetate, allyl chloroacetate, vinyl crotonate, vinyl cyclohexene, vinyl ethyl fumarate, nitrostyrene, methoxy styrene, chloroprene, vinyl naphthalene, vinyl piperidine, vinyl pyridine, N-vinyl pyrrolidone, vinyl stearate, vinyl sulfanilic acid, methyl vinyl sulfone, chloroethyl vinyl ether, vinyl benzychloride, β-chloroethyl vinyl phosphonate and diacetone acrylamide, said hydroxyl-terminated liquid polymer containing 1.7 to 10 hydroxyl groups per molecule.

4,489,009

PROCESS FOR PRODUCING SOLANONE, NORSOLANADIONE AND INTERMEDIATES THEREFOR

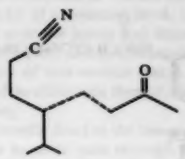
Kenneth K. Light, North Ogden, Utah; William L. Schreiber, Jackson, N.J.; Joseph A. McGhie, Montclair, N.J.; Ronald P. Schreck, Old Bridge, N.J.; Takao Yoshida, West Long Branch, N.J.; Loren B. Schreiber, Aberdeen, N.J., and Ranya Muralidhara, Fair Haven, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 357,158, Mar. 11, 1982, Pat. No. 4,412,083. This application Jul. 8, 1983, Ser. No. 511,944

Int. Cl.³ C07C *121/34, 121/30*

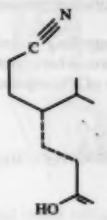
U.S. Cl. 260—465.6 **4 Claims**

1. A compound having the structure:



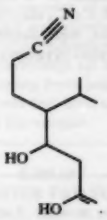
wherein one of the dashed lines is a carbon-carbon double bond and the other of the dashed lines is a carbon-carbon single bond.

2. A compound defined according to the structure:

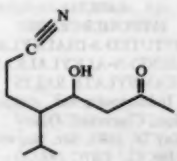


wherein one of the dashed lines is a carbon-carbon double bond and the other of the dashed lines is a carbon-carbon single bond.

3. A compound having the structure:



4. A compound having the structure:



4,489,010

META-ANILIDE AND META-ANILIDE UREA AND UREA SALT HERBICIDAL COMPOUNDS AND METHODS OF USE

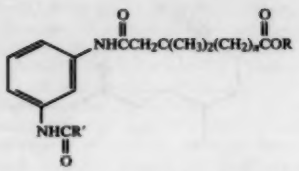
Eugene G. Teach, El Cerrito, and Jeffery T. Springer, El Sobrante, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 30, 1983, Ser. No. 567,284

Int. Cl.³ C07C *127/19*

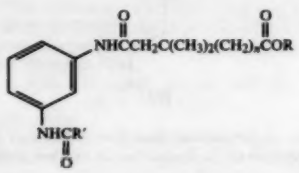
U.S. Cl. 260—501.11 **11 Claims**

1. A compound having the structural formula



wherein R is selected from the group consisting of hydrogen and C_1–C_3 alkyl ammonium; R′ is selected from the group consisting of C_2–C_8 alkyl, C_1–C_3 alkoxy, cyclopropyl, methacryl, C_1–C_3 alkylmercapto, methylamino, ethylamino, C_2–C_4 dialkylamino, C_2–C_4 alkylalkoxyamino; and n equals the integer 0 or 1.

7. The method of controlling undesirable vegetation comprising applying to the area where control is desired, an herbicidally effective amount of a compound having the formula



wherein R is selected from the group consisting of hydrogen and C_1–C_3 alkyl ammonium; R′ is selected from the group consisting of C_2–C_8 alkyl, C_1–C_3 alkoxy, cyclopropyl, methacryl, C_1–C_3 alkylmercapto, methylamino, ethylamino, C_2–C_4 dialkylamino, C_2–C_4 alkylalkoxyamino; and n equals the integer 0 or 1.

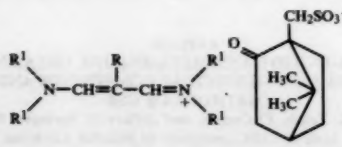
4,489,011

HYPOGLYCEMIC N-(2-SUBSTITUTED-3-DIALKYLAMINO-2-PROPENYLIDENE)-N-ALKYLALKANAMINIUM CAMSYLATE SALTS

Samuel S. M. Wang, Indianapolis, Ind., assignor to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed May 16, 1983, Ser. No. 494,742
Int. Cl.³ C07C *143/20*
U.S. Cl. 260—501.19 **4 Claims**

1. A compound of the formula



wherein R represents a group of formula R^2X; R^1 represents methyl or ethyl; R^2 represents straight or branched alkyl of from 1 to 12 carbon atoms, straight or branched alkenyl of from 2 to 12 carbon atoms, cycloalkyl of from 3 to 8 carbon atoms, cycloalkylalkyl of from 4 to 10 carbon atoms, phenyl or benzyl; and X is an oxygen atom or a divalent sulfur atom.

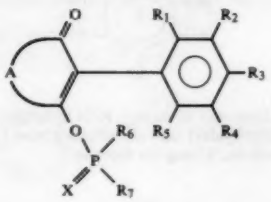
4,489,012

ENOL-PHOSPHOROUS ESTERS OF 2-ARYL-1,3-CYCLOALKANEDIONES COMPOUNDS

Leonard E. Hodakowski, St. Albans, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 351,419, Feb. 23, 1982, Pat. No. 4,409,153, which is a continuation of Ser. No. 134,865, Mar. 28, 1980, abandoned. This application Feb. 2, 1983, Ser. No. 463,314
Int. Cl.³ C07F *9/165*
U.S. Cl. 260—946 **18 Claims**

1. Compounds of the formula:



wherein:

R_1 is hydrogen alkyl, haloalkyl, halogen or polyhaloalkyl substituent;

R_2, R_3, R_4 and R_5 are individually hydrogen, nitro, polyhaloalkyl, halogen, cyano, alkyl, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, alkanoyl, amido, amino or haloalkyl group;

A is an alkylene or alkenylene chain containing two to three carbon atoms which may be substituted by one or more substituents which may be the same or different selected from:

(a) substituents containing from 1 to ten aliphatic carbon atoms selected from alkyl, alkenyl, cycloalkyl or cycloalkenyl groups, which groups can be further substituted with one or more cyano, halogen, nitro alkoxy, aryloxy, alkylthio, arylthio, alkylsulfinyl, arylsulfinyl, alkylsulfonyl, acylamido, or dialkylamino substituents in any combination; and a phenyl group which can be substituted by one or more alkyl, alkenyl, cycloalkyl, cycloalkenyl, cyano, halogen, nitro, alkoxy, aryloxy, alkythio, arylthio, alkylsulfinyl, arylsulfinyl, alkylsulfonyl, arylsulfonyl acylamido or dialkylamino substituents in any combination, or

(b) a divalent alkylene or alkenylene group having from 2 to 20 carbon atoms completing a 3, 4, 5, 6 or 7 membered carbon ring; wherein the said formed six-membered ring may optionally be aromatic.

X=O or S

R_6 and R_7 may be the same or different and individually can be, alkoxy, alkylthio, halogen, alkylthioalkyl, alkylsulfinyl, alkylsulfonyl, dialkylamino, cycloalkyl, alkyl up to 8 carbons, phenyl or phenoxy;

with the proviso that R_1, R_2, R_3, R_4 and R_5 individually may not include more than ten aliphatic carbon atoms.

4,489,013
PREPARATION OF α-OXO-α-(3-ALKOXYCARBONYL-2,2-DIMETHYL-CYCLOPROP-1-YL)-METHANE-PHOSPHONIC ACID ESTERS

Hellmut Hoffmann, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

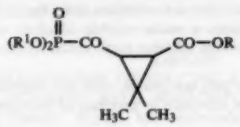
Continuation of Ser. No. 288,444, Jul. 30, 1981, abandoned, which is a division of Ser. No. 170,377, Jul. 21, 1980, Pat. No. 4,317,783. This application Oct. 7, 1983, Ser. No. 539,883

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1979, 2932262

Int. Cl.³ C07F 9/40

U.S. Cl. 260—968 **7 Claims**

1. A process for the preparation of an α-oxo-α-(3-alkoxycarbonyl-2,2-dimethyl-cycloprop-1-yl)-methane-phosphonic acid ester of the formula

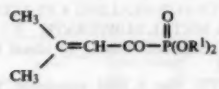


in which

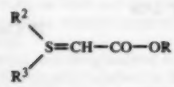
R is alkyl or a radical customary in the alcohol component of pyrethroids, and

R^1 is alkyl or phenyl, or the two radicals R^1 together are alkanediyl,

comprising reacting a 1-oxo-3-methyl-2-butene-phosphonic acid ester of the formula



with a sulphuranylidene-acetic acid ester of the formula



in which R^2 and R^3 each independently is alkyl or together are alkanediyl,

at a temperature between about 0° and 100° C.

4,489,014
VARIABLE VENTURI CARBURETOR

Tadashi Nagai; Eiichi Ohnishi; Giichi Shioyama, and Yutaka Matayoshi, all of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Oct. 11, 1983, Ser. No. 540,627

Int. Cl.³ F02M 9/06

U.S. Cl. 261—44 C **7 Claims**

1. A variable venturi carburetor attached to an intake pipe on the upstream side from a throttle valve, which comprises:

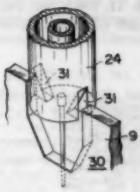
(a) a fixed venturi portion formed at the inner wall surface of the intake pipe and on the upstream side from the throttle valve;

(b) a nozzle body having a nozzle portion at the end thereof, said nozzle body being arranged at said fixed venturi portion for supplying fuel into an intake passage within the intake pipe;

(c) a suction piston serving as a movable venturi portion for forming a venturi between said fixed venturi portion and said movable venturi portion, said suction piston being moved to or away from said fixed venturi portion by the vacuum generated due to air passing through the venturi to vary the cross section of venturi for keeping the flow rate of intake air at a constant level, said suction piston being formed near the lower end thereof with a pair of first recesses obliquely and symmetrically cut off from the outer periphery of said suction piston to the lower end surface thereof on either side thereof widening to the fixed venturi portion;

(d) a tapered jet needle fixed to the lower end surface of said suction piston so as to pass through the nozzle portion formed in said nozzle body; and

(e) a wall member disposed at the nozzle portion extending perpendicularly to the longitudinal axis of the intake pipe, said wall member being formed at the middle portion



thereof with a second recess obliquely and symmetrically cut off widening to the movable venturi portion in such a way as to slidably engage with said two first recesses formed near the lower end of said suction piston,

whereby when said suction piston moves to or away from said fixed venturi portion, the cross section of the venturi is variably defined by said wall member and said suction piston with said first recesses of said suction piston slidably engaged with said wall member, so that the cross-sectional area of the venturi increases gradually in the vertical and horizontal directions on the cross section of the intake passage beginning from near said nozzle portion in order to uniformly mix fuel from said nozzle portion with air passing through the venturi.

4,489,015
HUMIDIFIER PAD SUPPORT

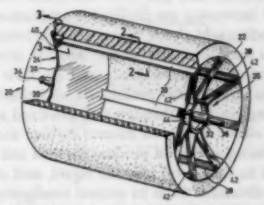
Kurt E. Petersen; Thomas E. Squires, and Charles G. Shepherd, all of Oakville, Canada, assignors to B. D. Wait Co. Limited, Oakville, Canada

Filed Apr. 11, 1983, Ser. No. 484,064

Claims priority, application Canada, Apr. 13, 1982, 400869

Int. Cl.³ B01F 3/04

U.S. Cl. 261—92 **9 Claims**



1. In a support for a tubular humidifier pad having first and second ends and stringers extending axially between the ends to support the pad, the improvement in which one of the ends comprises a central hub and spokes radiating from the hub, one to each of the stringers, the spokes being connected to the hub and to the stringers to permit angular movement between these parts axially so that movement of the hub from a first position

nearer the fixed end in which the spokes are inclined inwardly and towards the fixed end, and in which the stringers are parallel to support the pad, to a second position remote from the fixed end changes the angular relationships between the spokes and the stringers to cause the stringers to deflect inwardly towards the axis thereby facilitating replacement of a pad over said one of the ends before returning the movable end to said first position to support the new pad.

4,489,016

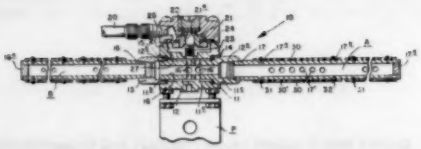
APPARATUS FOR DIFFUSING GASES INTO LIQUIDS

John E. Kriebel, Souderton, Pa., assignor to Capital Controls Company, Inc., Colmar, Pa.

Filed Feb. 11, 1983, Ser. No. 465,729

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—122 **12 Claims**



1. In a liquid in which an immersed injector having a chamber for containing gas under pressure and at least one port through which the gas flows for contact with the liquid at a predetermined gas flow rate and in which said gas interacts with the liquid at the point of contact therewith to form a solid product capable of accumulating on the injector and reducing said gas flow rate, the improvement comprising: elastic means mounted on said injector and operable periodically in response to an accumulation of said product thereon to clean itself automatically for maintaining said predetermined gas flow rate, said elastic means being interposed between said injector port and said liquid and cooperating with said injector to form an expandable chamber therebetween for receiving gas from said injector chamber, said elastic means having a plurality of pin-sized apertures through which the gas flows to contact the liquid, said elastic means distending into a predetermined normal configuration during gas flow from said expandable chamber through said pin-sized apertures at said predetermined gas flow rate when said apertures are clean of said solid product, said gas contacting said liquid and forming said solid product on said elastic means adjacent to said pin-sized apertures in the course of operation of said injector, said solid product accumulating on said elastic means to restrict gas flow through said pin-sized apertures, said gas flow restriction caused by said solid product increasing gas pressure in said expandable chamber for distending said elastic means from its normal distended configuration and increasing its size and the size of said pin-sized apertures therein to maintain said gas flow rate, further accumulations of said solid product on said elastic means further restricting gas flow through said pin-sized apertures and causing said elastic means to distend further and increase in size for fracturing said solid product thereon and causing said solid product to slough off into the liquid, said elastic means, after having distended from its normal configuration to clean said apertures of said solid product, contracting into its normal configuration to reduce the size of said pin-sized apertures for maintaining said predetermined gas flow rate, said elastic means thereby cooperating with said solid product and said gas in said expandable chamber to continuously modulate its size and the size of said apertures therein in the course of operation of said injector for automatically and periodically cleaning itself of the solid product and thereby maintaining said predetermined gas flow rate.

4,489,017

SPRAY DRYING OF MICROCAPSULE DISPERSIONS

Heinrich Alberts, Cologne; Manfred Dahm, Leverkusen; Gert Jabs, Odenthal, and Christian Wegner, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 171,305, Jul. 23, 1980, abandoned. This application Jul. 12, 1983, Ser. No. 512,974

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1979, 2930409

Int. Cl.³ B01J *13/02*

U.S. Cl. 264—4.7 **10 Claims**

1. The process for production of dry, free-flowing microcapsules having a core material encapsulated by a polyurea wall formed by interface polyaddition of a polyisocyanate and a polyamine, said process comprising:

(a) emulsifying the core material to be encapsulated and the polyisocyanate with an aqueous solution,

(b) adding to the emulsion the polyamine and from 1 to 10 parts by weight, based on microcapsules to be formed, of a water-soluble silicate, a water-soluble alkaline earth metal salt, a water-soluble alkaline earth metal hydroxide or mixtures thereof,

(c) polycondensing the polyisocyanate with the polyamine while maintaining the emulsion to produce microcapsules with polyurea walls,

(d) simultaneously and in situ forming an insoluble alkaline earth metal carbonate salt or an insoluble polysilicate from the corresponding water-soluble alkaline earth metal salt and hydroxide or silicate whereby an aqueous suspension of microcapsules is formed, and

(e) spray drying said aqueous suspension.

4,489,018

METHOD AND APPARATUS FOR SEALING A PLASTICS MATERIAL TO A METAL SUBSTRATE

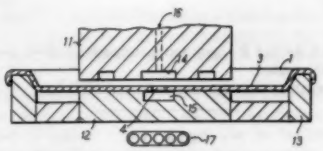
Martin F. Ball, Shrivenham, England, assignor to Metal Box Limited, Reading, England

Continuation of Ser. No. 240,778, Mar. 5, 1981, abandoned. This application Jul. 6, 1983, Ser. No. 511,443

Claims priority, application United Kingdom, Mar. 25, 1980, 8009976

Int. Cl.³ B29C *6/04*

U.S. Cl. 264—25 **25 Claims**



1. A method of forming a closure member in a metal container comprising the steps of providing a metal container end having opposite surfaces and an aperture therethrough of a predetermined size and peripheral outline, providing a mould formed of two dies each having a cavity of a predetermined size and peripheral outline larger than the predetermined size and peripheral outline of the aperture and at least one of the dies having a die portion transparent to electromagnetic energy, clamping the metal container end between the dies with the aperture in general alignment with the die cavities and proximate the die portion thereby exposing to each cavity and the die portion a peripheral edge portion of the metal container end contiguous the aperture, injecting flowable plastics material into the cavities and the aperture therebetween, generating electromagnetic energy exteriorly of the cavity so as to transmit the same through the die portion, and thereby effect localized induction heating of only the aperture peripheral edge

portion during the injection step to sealingly adhere the plastics material to the opposite surface at the peripheral edge portion thereby forming a closure member in the container end.

11. Apparatus for injection moulding a plastics material onto a metal substrate comprising first and second dies between which a metal substrate is adapted to be disposed when said dies are closed, at least one of said dies including means for defining a cavity of a predetermined peripheral outline exposed to and opening in a direction toward a predetermined surface portion of the metal substrate which is to be coated with plastics material, means for injecting plastics material into said cavity in conformity therewith and against said predetermined surface portion, at least one of said dies being defined in part by a die portion transparent to electromagnetic energy, and means for generating electromagnetic energy exteriorly of said cavity approximate said die portion and transmit the same through said die portion to thereby effect localized induction heating of the predetermined surface portion during the injecting of the plastics material into said cavity.

4,489,019

METHOD FOR PRODUCING A LONGITUDINAL MOLDING WITH NONUNIFORM SECTIONS

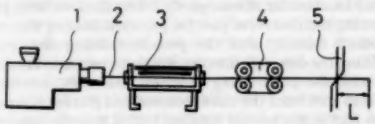
Shinji Takeda, Toyota, and Nobutoshi Hase, Nishio, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Dec. 9, 1982, Ser. No. 448,343

Claims priority, application Japan, Dec. 22, 1981, 56-207336; Dec. 22, 1981, 56-207337

Int. Cl.³ B29H *5/26*

U.S. Cl. 264—26 **7 Claims**



1. A method for forming a molding, which comprises:

forming at least one longitudinal body made of thermoplastic resin, which comprises a main part of a resulting molding;

placing said longitudinal body in a mold;

high frequency dielectric heating said longitudinal body in said mold until at least a surface portion of said longitudinal body is melted by said high frequency dielectric heating; and

cooling said longitudinal body in said mold so as to produce a partially reshaped molding.

4,489,020

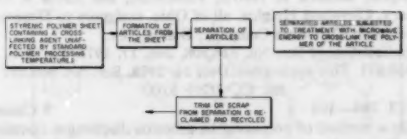
METHOD OF FORMING CROSSLINKED STYRENIC POLYMER ARTICLES AND THE ARTICLES

Daniel J. Dibiasi, Pittsford, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 20, 1982, Ser. No. 450,851

Int. Cl.³ B29D *27/00*

U.S. Cl. 264—26 **8 Claims**


STYRENIC POLYMER SHEET CONTAINING A CROSS-LINKING AGENT UNAFFECTED BY STANDARD POLYMER PROCESSING TEMPERATURES
FORMATION OF ARTICLES FROM THE SHEET
SEPARATION OF ARTICLES
SEPARATED ARTICLES SUBJECTED TO TREATMENT WITH MICROWAVE ENERGY TO CROSS-LINK THE POLYMER OF THE ARTICLE
TRIM OR SCRAP FROM SEPARATION IS RECLAIMED AND RECYCLED

1. The method of forming crosslinked styrenic polymer articles comprising:

(a) providing a styrenic polymer sheet containing a crosslinking agent therefor which is capable of producing a crosslinked structure when activated by microwave energy but which is unaffected by standard polymer sheet processing temperatures;

(b) forming articles from said sheet;

(c) separating and recycling reclaimable trim or scrap from said articles; and

(d) subjecting said articles to sufficient microwave energy for a sufficient period of time to effectively crosslink the styrenic polymer of said articles.

4,489,021

PROCESS FOR MANUFACTURING LARGE-LENGTH AND LARGE-DIAMETER HOSES

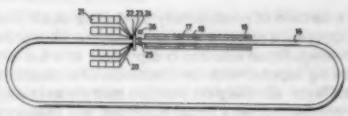
Sándor Antal; Péter Smaroglay, and Elemér Lantos, all of Budapest, Hungary, assignors to Taurus Gumilipari Vàllalat, Budapest, Hungary

Filed Aug. 27, 1982, Ser. No. 412,450

Claims priority, application Hungary, Sep. 3, 1981, 2252/81

Int. Cl.³ B29H *5/01*

U.S. Cl. 264—27 **3 Claims**



1. A process for manufacturing a vulcanized large-diameter, large-length hose, comprising applying the component parts, including metal reinforcing plies, required for hose fabrication onto a flexible foundation lead through an advancing or an advancing and rotating movement thereof while conveying the hose along a closed curve track and vulcanizing the fabricated hose by introducing electric current into the internal reinforcing plies of the hose.

4,489,022

FORMING COHERENT REFRACTORY MASSES

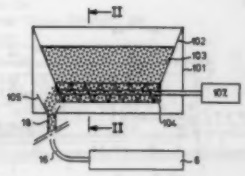
Pierre Robyn, Nivelles, and Pierre Deschepper, Charleroi, both of Belgium, assignors to Glaverbel, Brussels, Belgium

Filed Sep. 17, 1982, Ser. No. 420,502

Claims priority, application United Kingdom, Nov. 25, 1981, 8135569

Int. Cl.³ F27D *1/16*

U.S. Cl. 264—30 **14 Claims**



1. A process of forming a refractory mass comprising burning particles of exothermically oxidisable material having an average grain size less than 50 μm while mixed with particles of incombustible refractory material during projection of the mixture against a surface to form a coherent refractory mass on said surface, said oxidisable material comprises silicon and aluminum, the aluminum being present in an amount not exceeding 9% by weight of the total mixture, and wherein the aluminum and silicon are together present in an amount not exceeding 15% by weight of the total mixture.

4,489,023

METHOD OF AND AN INSTALLATION FOR THE CONTINUOUS PRODUCTION OF BLOCK-FOAM

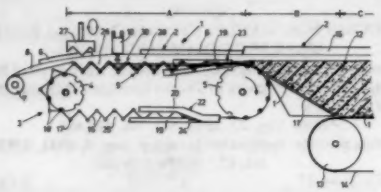
Ferdinand Proksa, Leverkusen, Fed. Rep. of Germany, assignor to Maschinenfabrik Hennecke GmbH, Leverkusen, Fed. Rep. of Germany

Filed Jun. 6, 1983, Ser. No. 501,471

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1982, 3222959

Int. Cl.³ B29D *27/04*

U.S. Cl. 264—54 10 Claims



1. In a method of continuously producing block-foam comprising applying a reaction mixture produced from at least two foam-forming, liquid reaction components to a foil conveyed on a moving support with the formation of a closed, laterally restricted layer, allowing the reaction mixture to change into a creamy condition from a liquid condition, and finally completing the foaming reaction, the improvement wherein at least a part of the reaction mixture is charged in portions to said foil, the individual portions being successively guided and wherein the successive portions are only combined together to form a closed layer once they have become creamy, and further characterized in that the foil is formed into troughs which extend transversely to the conveying direction, and into each of which a portion of reaction mixture is introduced, and the troughs are flattened again by a reverse shaping procedure.

4,489,024

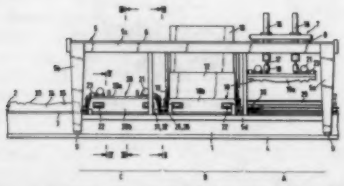
METHOD OF AND APPARATUS FOR THE MANUFACTURE OF PREFABRICATED PRESTRESSED CONCRETE MEMBERS

Peter Auer, Ottobrunn; Fritz Kluge, Munich-Grosshadern; Helmut Lieske, and Horst Wutzler, both of Munich, all of Fed. Rep. of Germany, assignors to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 20, 1981, Ser. No. 285,043

Int. Cl.³ B28B *3/04*

U.S. Cl. 264—71 5 Claims



1. A method of manufacturing individual prefabricated prestressed concrete members each containing prestressing members, such as prestressed concrete ties, where the concrete members have an immediate direct bond with the prestressing member, including using forms for shaping the concrete members with each form arranged to hold an individual concrete member and with the form made up of at least a first form part and a second form part, positioning the forms on an elongated stressing bed having a first end and a second end and a length sufficient between the first and second ends to receive a multiple number of the concrete members arranged in a row extending in the elongated direction of the stressing bed, and arranging the forms in at least one row commencing adjacent the first end of the stressing bed, placing continuous prestressing members over and extending along the elongated direction of the stressing bed for the at least one row and stressing such members between rigid abutments located at the first and second ends of the stressing bed so that the prestressing members afford prestressing of each of the individual concrete members to be formed in the at least one row, wherein the improvement comprises maintaining the stress on the prestressing members while constructing the concrete members one after another along the elongated direction of the bed so that the prestressing members extend continuously through and between the formed concrete members, establishing a group made up of a first location, a second location and a third location arranged in series adjacent to and following one another in the elongated direction on the stressing bed so that the group of first, second and third locations can be moved as a unit along the stressing bed, positioning the first location closer to the first end of the stressing bed and followed in the elongated direction thereof by the second location and then the third location with the third location located closer to the second end of the stressing bed, providing a poured concrete member within the assembled form parts in the first location with the prestressing members extending through the poured concrete member, placing a first form part on the stressing bed in the second location so that the stressed prestressing members extend freely and unsupported in the elongated direction of the prestressing bed through the first form part and between the first form part and the third location, pouring concrete into the first form part in the second location for at least partly filling the first form part and vibrating the first form part for preconsolidating the concrete poured therein, after the preconsolidating step completely filling the concrete into the first form part into bonding contact with the prestressing members and then moving a second form part from the third location and placing it on the first form part in the second location into which the concrete has been poured and is completely filled and attaching the second form part to the first form part, vibrating the attached first and second form parts and effecting the main consolidation of the concrete member, following completion of the main consolidation of the concrete member in the second location stripping the first and second form parts from the poured concrete member located in the first location on the stressing bed, moving the group of locations downstream in the elongated direction of the stressing bed toward the second end thereof so that the first location is positioned in the location vacated by the second location and second location is in the position vacated by the third location, placing the first form part stripped in the first location in the relocated second location and repeating the working cycle until the concrete members extend one after the other along the stressing bed between the rigid abutments for the prestressing members.

4,489,025

PREPARATION OF DIMENSIONALLY STABLE ASBESTOS DIAPHRAGMS

Robert W. Fenn, III, Painesville; Emory J. Pless, Cleveland Heights; Richard L. Harris, Painesville, and Kevin J. O'Leary, Cleveland Heights, all of Ohio, assignors to Diamond Shamrock Chemicals Company, Dallas, Tex.

Continuation of Ser. No. 324,508, Jan. 17, 1973, Pat. No. 4,410,411. This application Dec. 14, 1978, Ser. No. 969,587

Int. Cl.³ B29F *5/00*

U.S. Cl. 264—104 9 Claims

1. In a method of preparing an asbestos diaphragm containing a thermoplastic resin which method comprises forming a fibrous chrysotile asbestos mat having the resin therein and thereafter heating the mat to fuse said resin, the improvement wherein which method comprises depositing said asbestos diaphragm from an aqueous slurry consisting essentially of (1)

water containing about 3.75% of each of sodium chloride and sodium hydroxide, or mixtures thereof with water and (2) from about 5 to 30 grams per liter of total asbestos and resin, wherein the resin is about 1.0–70%, by weight, of the total asbestos and resin and wherein the resin is selected from the group consisting of:

(a) polyethylene or polystyrene; and

(b) polyvinyl fluoride, polyvinylidene fluoride, polyvinyl chloride or polyvinylidene chloride.

4,489,026

PROCESS FOR PREPARING SOLID UNIT DOSAGE FORMS OF ULTRA-LOW DOSE DRUGS

Samuel H. Yalkowsky, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Sep. 7, 1982, Ser. No. 415,294

Int. Cl.³ A61K *9/00*

U.S. Cl. 264—123 **7 Claims**

1. A process for the preparation of a solid unit dosage form, pharmaceutical composition containing an ultra-low dosage of a pharmaceutically active material, comprising the steps of:

dissolving said pharmaceutically active material in a volatile inert solvent to form a dilute solution of said pharmaceutically active material;

atomizing and uniformly spraying said solution in the form of fine droplets, in a small amount, over an extended time period, onto fine, inert, pharmacologically acceptable, excipient particles which are undergoing continuous agitation while in contact with surrounding gaseous medium, said excipient particles being insoluble in said solvent, and continuously evaporating said solvent and depositing large numbers of very small solid particles of said pharmaceutically active material uniformly on said excipient particles under conditions effective to prevent substantial agglomeration of said excipient particles or build-up of wetness in said excipient particles; and

then forming said excipient particles containing said particles of said pharmaceutically active material into said solid unit dosage form pharmaceutical composition having an effective dosage of not more than 100 micrograms of said pharmaceutically active material per unit of said solid unit dosage form.

4,489,027

PROCESS FOR PREPARING SOLVENT RESISTANT, THERMOPLASTIC AROMATIC POLY(IMIDESULFONE)

Terry L. St. Clair, Poquoson, Va., and David A. Yamaki, Deptford, N.J., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

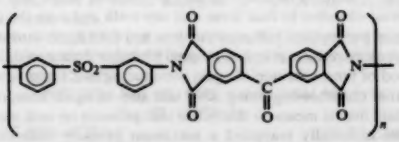
Division of Ser. No. 407,240, Aug. 11, 1981, Pat. No. 4,398,021.

This application May 6, 1983, Ser. No. 492,282

Int. Cl.³ B29G *5/00*; B32B *31/20*

U.S. Cl. 264—137 **3 Claims**

1. A process of molding an poly(imidesulfone) having the inherent physical property characteristics of being thermoplastically processible in the temperature range of 250°–350° C. to yield high quality tough moldings; strong high temperature resistant adhesive bonds and well formed structural composites and having the basic structure of:



where n is an integer and represents up to several hundred repeat units and formed as the reactant product of equimolar quantities of 3,3',4,4'-benzophenonetetracarboxylic dianhydride and 3,3'-diaminodiphenylsulfone dissolved in bis(2-methoxyethyl)ether to produce a poly(amide-acid sulfone) and thereafter converted to the poly(imidesulfone) by heat, comprising:

positioning a quantity of the polymer in the mold cavity of a hydraulic press provided with heated platens, heating the platens to approximately 220° C. and maintaining this temperature for approximately fifteen minutes, inserting a plunger into the mold cavity and applying an increasing pressure onto the heated quantity of polymer over a period of approximately five minutes to approximately 300 pounds per square inch, increasing the mold temperature to approximately 280° C. at an increasing rate of approximately 5° C. per minute, maintaining this pressure and temperature for approximately thirty minutes, allowing the mold to cool to approximately 100° C., releasing the pressure, opening the mold to recover a cured poly(imidesulfone).

3. A method of making graphite fiber reinforced poly(imidesulfone) moldings comprising:

reacting equimolar quantities of 3,3',4,4'-benzophenonetetracarboxylic dianhydride and 3,3'-diaminodiphenylsulfone in bis(2-methoxethyl)ether to obtain a poly(amide-acid sulfone) solution,

embedding a layer of unidirectional graphite fibers in the poly(amide-acid sulfone) solution and subsequently treating 12 hours at 35°–40° C. to effect evaporation of the solvent to result in a mixture consisting of 40% by weight of poly(amide-acid sulfone) and 60% by weight graphite fibers thus leaving the fibers in a coated mat condition,

cutting the coated mat into a plurality of linear sheets,

heating these sheets in an oven for approximately 30 minutes at approximately 100° C. and thereafter for an additional 30 minutes at approximately 220° C. to remove the remaining solvent and convert the poly(amide-acid sulfone) into poly(imide sulfone),

stacking a plurality of the cured fiber/poly(imidesulfone) sheets in a mold cavity having a hydraulic press and heat platens,

applying a pressure of approximately 400 psi while increasing the mold temperature to approximately 280° C.,

maintaining this pressure and temperature for approximately one hour,

terminating heating and permitting the mold to cool to approximately 100° C.,

releasing the mold pressure and recovering a graphite/poly(imidesulfone) molding having the physical property characteristics enumerated below:

Unidirectional Graphite Fiber Reinforced Composites of Poly(imidesulfone)	
Thickness, cm	0.25
Interlaminar Shear Strength, psi	
Test Temp	
RT	11,500
121° C.	7,000
177° C.	6,900
Softening Temperature, °C.	205
Resin Content, %	33
Density, g/cc	1.5

4,489,028

KAYAK IMPROVEMENTS

William E. Masters, 313 Dogwood La., Easley, S.C. 20640

Filed Nov. 22, 1982, Ser. No. 443,594

Int. Cl.³ B29C *5/04*

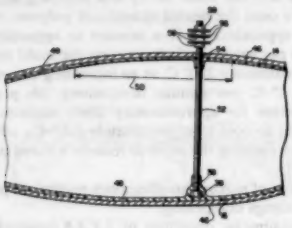
U.S. Cl. 264—154 **4 Claims**

1. A method of attaching an element to the inner surface of a rotationally molded structure, comprising:

connecting said element to one end of an elongated heat conductive member;

attached said heat conductive member to a mold for producing said structure such that said element is spaced from said mold by a distance sufficient to permit mold material to flow between said element and said mold;

rotationally molding said structure by heating said mold, filling said mold with mold material, and rotating said mold, whereby heat from said mold is transferred through



said heat conductive member to said element and causes said mold material to melt around and adhere to said element when taking the shape of said mold;

removing said member from said molded structure by cutting a portion out of said molded structure around said member and disconnecting said element from said heat conductive member.

4,489,029

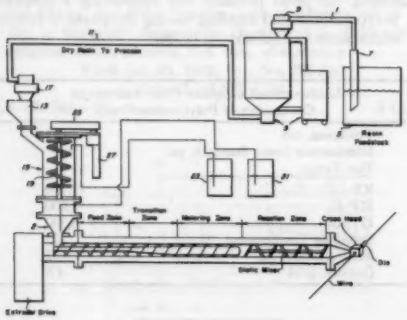
COMPOSITIONS BASED ON ALKYLENE-ALKYL ACRYLATE COPOLYMERS AND SILANOL CONDENSATION CATALYSTS; AND THE USE THEREOF IN THE PRODUCTION OF COVERED WIRES AND CABLES

Michael J. Keogh, Somerville; Scott L. Wallace, Hillsborough, and Geoffrey D. Brown, Bridgewater, all of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 1, 1983, Ser. No. 498,341

Int. Cl.³ C08F 8/00; B29F 3/10

U.S. Cl. 264—174 **12 Claims**



1. A process of extruding a composition about a wire or cable which comprises soaking a composition consisting essentially of an alkylene-alkyl acrylate copolymer and a silanol codensation catalyst with an organo titanate, admixing said soaked composition with a polysiloxane or monomeric silane with the result that the polysiloxane or monomeric silane reacts with said alkylene-alkyl acrylate copolymer to produce a product containing a water-curable, silane modified alkylene-alkyl acrylate copolymer and extruding said product about a wire or cable.

4,489,030

METHOD OF MAKING A TOP TOOTHED ENDLESS POWER TRANSMISSION BELT CONSTRUCTION

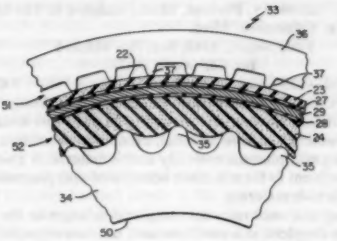
Alden W. Brooks, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 357,242, Mar. 10, 1982, Pat. No. 4,409,047. This application Aug. 8, 1983, Ser. No. 521,480

The portion of the term of this patent subsequent to Oct. 11, 2000, has been disclaimed.

Int. Cl.³ B28B 11/08

U.S. Cl. 264—293 **8 Claims**



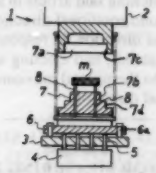
1. In a method of making a top toothed endless power transmission belt construction formed mainly of polymeric material and comprising the steps of disposing said material in substantially cylindrical form on a substantially cylindrical drum-like support member having an internal chamber, disposing a substantially cylindrical collapsible toothed matrix means about said disposed material, surrounding the assembled matrix means and support member with said material therebetween in an external chamber, interconnecting the space between said matrix means and said support member to said internal chamber, and then compressing said toothed matrix means toward said inner support member with the pressure of pressurized steam introduced into said external chamber and thus against said matrix means to form top teeth in said material and cure the thus formed material with the heat of said steam into a top toothed belt construction, the improvement wherein said step of compressing comprises the steps of initially compressing said matrix means toward said inner support member with said pressurized steam for a first period of time that heats the gas in said polymeric material to expand the gas before the curing of said polymeric material, introducing pressurized steam into said internal chamber during said first period of time, thereafter venting said chambers to release said pressure on said matrix means and inside said support member for a second period of time to permit said expanded gas to escape from said polymeric material into said internal chamber and be vented therefrom, then again compressing said matrix means toward said inner support member with said pressurized steam for a third period of time by introducing said pressurized steam into said external chamber to final form said top teeth and cure the thus formed top toothed belt construction, and then again introducing pressurized steam in said internal chamber during said third period of time, said step of again introducing said steam in said internal chamber beginning after said step of again compressing said matrix means so that when said pressure on said matrix means is initially reapplied a maximum pressure differential exists across said matrix means and acts in a direction to compress said matrix means toward said support member for a period of time before said pressure in said internal chamber is reapplied.

4,489,031

METHOD FOR MOLDING PLASTIC MATERIAL BY MECHANICAL PRESS

Susumu Ogihara, Hachioji, Japan, assignor to Susumu Ogihara, Sagamihara, Japan

Filed Dec. 16, 1982, Ser. No. 450,557
Claims priority, application Japan, Feb. 22, 1982, 57-27580
Int. Cl.³ B29C *3/00*
U.S. Cl. 264—294 1 Claim



1. A method for molding plastic materials which release gas during molding by operating a mechanical rotary crank type press having opposed metal die parts respectively carried on a slide driven by a crank mechanism and on a floating die plate supported on a die cushion and movable against a bolster on the press, said method comprising:

pre-heating a blank of a thermoplastic material containing glass fiber reinforcement, which thermoplastic material releases gas during molding to a molding temperature in the range from 70° to 280° C.;

placing the blank between said metal die parts;

operating the crank mechanism of the press to drive the slide in a direction toward a bottom dead center position to a first position at which the pressure applied to the blank is from 10 to 50% of the pressure applied at the position corresponding to the bottom dead center position of the crank mechanism, said first position being within a range of positions in the movement of the slide where only the reaction force of the die cushion is received by the blank;

holding the slide at said first position for a time from a fraction of a second up to three seconds for permitting release of the gas from the thermoplastic material of the blank;

further operating the crank mechanism of the press to drive the slide to the position thereof corresponding to the bottom dead center position of the crank mechanism;

exerting pressure on the blank against the bolster of the press;

then driving the slide from said last-mentioned position in the opposite direction to a further position where only the reaction force of the die cushion is received by the blank; and

holding the blank for a time from 5 to 40 seconds at said further position for cooling and solidifying the blank,

whereby the so-called "sticking phenomenon" of the slide is avoided and the blank is molded into a product free of air bubbles, with a very smooth surface, and with improved strength.

4,489,032

METHOD OF HOT PRESSING REACTIVE MATERIALS

Andre Ezis, Grosse Ile, and Warren B. Copple, Dearborn Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

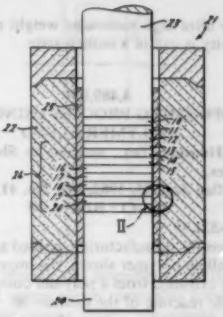
PCT No. PCT/US82/01370, § 371 Date Sep. 30, 1982, § 102(e) Date Sep. 30, 1982, PCT Pub. No. WO84/01369, PCT Pub. Date Apr. 12, 1984
PCT Filed Sep. 30, 1982, Ser. No. 444,902
Int. Cl.³ C03B *23/20*
U.S. Cl. 264—325 10 Claims

1. A method of hot pressing agglomerated Si_3N_4 comprising powdered materials in a pressing assembly having graphite walls the carbonaceous decomposition products of the walls reactive with the material to be pressed under the temperature and pressure conditions to be experienced at the interface between the material and reactive walls, comprising:

(a) forming a plurality of generally flat stackable billets of said powdered material;

(b) stacking said billets in said hot pressing assembly aligned with the direction of pressing;

(c) interposing a barrier wall between the interface of said billets with said pressing assembly and along at least a zone of said assembly in which a temperature of 1600°–1750° C. and a pressure of at least 1000 psi will be experienced at said interface during hot pressing, said barrier wall being effective to prevent a chemical and physical reaction between the Si_3N_4 of said billets and the decomposition products of said graphite walls of said pressing assembly; and



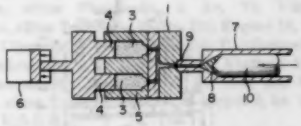
(d) hot pressing said billets within said assembly to achieve a desired density in each of said billets.

4,489,033

PROCESS FOR INJECTION COMPRESSION MOLDING

Naotake Uda, Yamaguchi; Yasuo Kouno, Iwakuni, and Tadayoshi Shiomura, Yamaguchi, all of Japan, assignors to Mitsui Petrochemical Industries, Tokyo, Japan

Filed Apr. 12, 1982, Ser. No. 367,286
Claims priority, application Japan, Apr. 14, 1981, 56-55011
Int. Cl.³ B29F *1/06*
U.S. Cl. 264—328.7 7 Claims



1. A process for injection compression molding ultra high molecular weight ploye thylene having an intrinsic viscosity of at least 3 dl/g measured at 135° C. in decalin and a melt index of up to 0.01 g/10 min which comprises,

(a) heating ultra high molecular weight polyethylene to 170°–240° C.,

(b) adjusting the volume of the mold cavity V_1 in a mold at a mold temperature of from 80° C. to 120° C. to be equal to the volume of the molded article V_0,

(c) injecting ultra high molecular weight polyethylene having volume V_0 into the molded cavity through a runner portion at a shear rate of at least 20,000 sec^{-1},

(d) instantaneously expanding the mold cavity to adjust its volume V_1 to satisfy the relation:

$$1.2\ V_0 \leqq V_1$$

at a time from T_1, immediately before completion of injection and time T_2 while there is a pressure difference between the cavity and the runner portion, and the ultra high molecular weight polyethylene in the runner portion has not solidified, and

(e) compressing the volume of the mold cavity V_1 to satisfy the relation:

$$V_1 = V_0$$

while the ultra high molecular weight polyethlene in the mold cavity is still in a molten state.

4,489,034

THERMOFORMING PROCESS USING MODIFIED POLYMER BLEND

Sol Davison, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 25, 1982, Ser. No. 411,165
Int. Cl.³ B29F 1/08
U.S. Cl. 264—331.15 **19 Claims**

1. In a process for manufacturing molded articles by thermoforming crystalline polymer sheets, the improvement wherein said sheets are extruded from a polymer composition prepared by the peroxide reacting of the mixture of:

(a) 65 to 95 percent by weight of a mixture of about 50 to about 96 percent by weight of a crystalline isotactic poly(alpha-olefin) selected from the group consisting of polypropylene and polybutylene and about 50 to about 4 percent by weight of a polyethylene;

(b) 5 to 35 percent by weight of an impact modifier; and

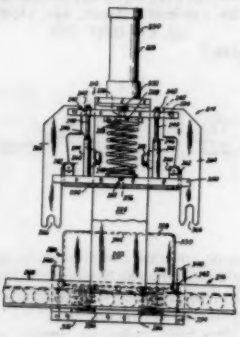
(c) an effective amount of a 1,2 polybutadiene crosslinking efficiency improver.

4,489,035

MOLD OPENING METHOD

Theodore E. Coffey, Pennsauken, N.J., assignor to Lynne M. Zitin, Cherry Hill, N.J.

Division of Ser. No. 201,869, Oct. 31, 1980, Pat. No. 4,376,622.
This application Mar. 14, 1983, Ser. No. 474,850
Int. Cl.³ A22C 7/00; B29C 7/00
U.S. Cl. 264—335 **27 Claims**



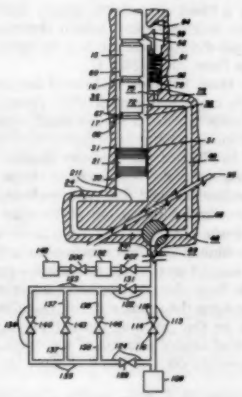
1. A method of opening a mold having first and second individually operable locking mechanisms which cooperate to lock a first mold section, which contains an article, to a second mold section, including the steps of arranging said first mold section above said second mold section; automatically opening said first locking mechanism; automatically opening said second locking mechanism; pushing said second mold section away from said first mold section after the opening of said first and second locking mechanisms; permitting said second mold section to fall away from said first mold section; positioning a pivotable catcher below said mold; catching said second mold section in said catcher; pivoting said catcher in a first rotational direction in response to the presence of said second mold section in said catcher; ejecting said second mold section from said catcher in response to the pivotal movement of said catcher in said first rotational direction; ejecting said article from said first mold section by a blast of air injected into said first mold section after said second mold section has fallen away from said first mold section; repositicning said catcher under said mold after the ejection of said second mold section from said catcher; catching said article in said catcher; pivoting said catcher in a second rotational direction, which is opposite to said first rotational direction, in response to the presence of said article in said catcher; and ejecting said article from said catcher in response to the pivotal movement of said catcher in said second rotational direction.

4,489,036

APPARATUS FOR MEASURING FRICTION OF HYDRAULIC CONTROL ROD DRIVES IN NUCLEAR REACTORS

Kenneth J. Jamrus, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Apr. 16, 1982, Ser. No. 369,182
Int. Cl.³ G21C 7/08
U.S. Cl. 376—229 **6 Claims**



1. In an hydraulic drive system for insertion and withdrawal of control rods in a nuclear reactor vessel and having associated with each of said control rods a rod-supporting index tube, an index tube piston connected to said index tube, a movable collet engageable with said index tube, means biasing said collet into engagement with said index tube, a collet piston connected to said collet, a first inlet effective to apply pressurized liquid to one side of said index tube piston to actuate said index tube in the direction of insertion, a second inlet effective to apply pressurized liquid to the opposite side of said index tube piston to actuate said index tube in the direction of withdrawal, a third inlet effective to apply pressurized liquid to said collet piston to overcome said biasing means and move said collet out of engagement with said index tube, and a selector valve connectable to a pressurized liquid source and effective to selectively admit pressurized liquid from said source alternatively to said first inlet or both said second and third inlets, apparatus for measuring the resistance of said pistons to actuation comprising:

(a) at least two conduits connecting an inlet of said selector valve of said pressurized liquid source;

(b) control valve means in a first of said conduits and selectively operable between a closed position and a normal operating position allowing liquid flow therethrough

sufficient for effecting the with drawal and insertion of a plurality of said control rods;

(c) shunt valve means in a second of said conduits and controllable for adjusting the flow of liquid therethrough to control the rate of travel of actuated pistons; and

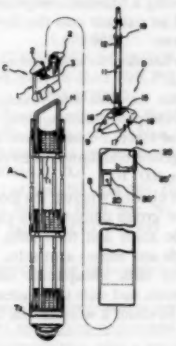
(d) pressure-sensing means effective to indicate the difference between a reference pressure and the pressure of liquid at the inlet of said selector valve.

4,489,037

APPARATUS FOR AUTOMATICALLY ADJUSTING CHANNEL BOX FITTING POSITION RELATIVE TO NUCLEAR FUEL ASSEMBLY

Seitaro Go, Tsuruga, Japan, assignor to Yugen Kaisha Go Chuzo Tekko Sho, Fukui, Japan

Filed Sep. 14, 1982, Ser. No. 417,940
Claims priority, application Japan, Sep. 18, 1981, 56-148380
Int. Cl.³ G21C *19/20*
U.S. Cl. 376—261 4 Claims



1. An automatic channel box fitting position adjusting apparatus for fitting a channel box (B) in form of square pipe to a nuclear fuel assembly (A) substantially in form of a rectangular parallelepiped and having an inverted U-shaped hanger (H) diagonally of an upper tie plate (T1) thereof, said apparatus comprising;

a position adjusting mechanism (C) including a hanger cap (1) removably attachable to said hanger (H) through a hook clamp (3) engageable with and disengageable from said hanger (H), and a pair of guide rollers (2) having axes of rotation (X) diagonal of said tie plate (T1) in plan view and inclined downwardly toward outer ends thereof in side view when said position adjusting mechanism (C) is attached to said hanger (H) thereby to be rotatable by contact with bottom inner walls of said channel box (B), and

a jig (D) including a rotatable and axially movable operating rod (11), a clamp pin (14) secured to an extreme end of said rod (11), and a cover (9) pivotable relative to said rod (11), for carrying said position adjusting mechanism (C) and operating said hook clamp (3) to engage with and disengage from said hanger (H),

wherein said pair of guide rollers (2) are shaped to taper along the axes of rotation (X) toward outer ends thereof and are cantilevered at large diameter ends thereof by frames (4) extending from said hanger cap (1).

4,489,038

FUEL ASSEMBLY FOR A NUCLEAR REACTOR

Olov Nylund, Västerås, Sweden, assignor to AB Asea-Atom, Västerås, Sweden

Filed Jan. 22, 1982, Ser. No. 341,978
Claims priority, application Sweden, Feb. 3, 1981, 8100778
Int. Cl.³ G21C *3/34*
U.S. Cl. 376—446 7 Claims

1. In a nuclear reactor fuel assembly of the type including a housing wall and spacer means removably located within said housing wall, said spacer means comprising a plurality of spacer cells each adapted to receive an elongated fuel rod and thereby to locate such fuel rods in spaced-apart relationship within said housing wall, the improvement comprising:

a portion of said housing wall confronting said spacer means being provided at least at one location with a first locking means; and

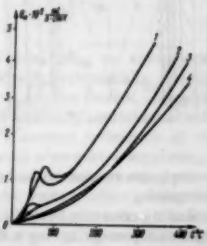
one of said spacer cells being provided with a second locking means, movable between active and inactive positions in response, respectively, to insertion and removal of a fuel rod into and from said one spacer cell, for preventing said second locking means from moving past said first locking means in the direction of elongation of said fuel rods when said second locking means is in its active position but for allowing said second locking means to move past said first locking means when said second locking means is in its inactive position.

4,489,039

PALLADIUM-BASED ALLOY

Natalia R. Roshan, Yaroslavskoe shosse 57, kv. 36; Natalia I. Parfenova, ulitsa Plescheeva, 1, kv. 73; Viktoria P. Polyakova, ulitsa Trofimova 15, kv. 201; Evgeny M. Savitsky, ulitsa D. Ulyanova, 3, kv. 13; Alexandr P. Mischenko, Teply Stan, 2 mikroraion, korpus 27, kv. 427; Vladimir M. Gryaznov, Lomonosovsky prospekt, 14, kv. 504, and Maria E. Sarylova, ulitsa Veshnyakovskava, 6, korpus 3, kv. 142, all of Moscow, U.S.S.R.

Continuation of Ser. No. 325,798, Nov. 30, 1981, abandoned. This application Oct. 3, 1983, Ser. No. 538,500
Int. Cl.³ B01D *59/12*
U.S. Cl. 420—463 1 Claim



1. A palladium based alloy consisting essentially of re-

thenium and yttrium in the following amounts, percent by mass:

ruthenium	4 to 8
yttrium	1 to 8
palladium	the balance

4,489,040

CORROSION RESISTANT NICKEL-IRON ALLOY

Aziz I. Asphahani; Eugene W. Kelley, and Juri Kolts, all of Kokomo, Ind., assignors to Cabot Corporation, Kokomo, Ind.

Filed Apr. 2, 1982, Ser. No. 364,954
Int. Cl.³ C22C *30/00*
U.S. Cl. 420—584 **10 Claims**

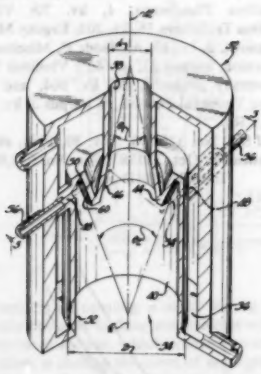
1. An alloy suitable for use in deep sour gas wells consisting essentially of, in weight percent, 0.001 to 0.06 carbon, 20 to 24 chromium, 2 to 4.5 molybdenum, up to 2.5 manganese, 34 to 38 nickel, up to 1 silicon, up to 3.5 tungsten, 0.03 to 0.35 nitrogen, up to 0.75 copper, up to 4 cobalt, up to 1 columbium plus tantalum, up to 0.25 titanium and the balance iron and incidental impurities, provided that the iron-to-nickel ratio is between 0.8 and 1.2 to 1 to provide the combined characteristics of corrosion resistance, high strength in the cold-worked condition and resistance to sulfide stress cracking and stress corrosion cracking.

4,489,041

NON PLUGGING FALLING FILM PLASMA REACTOR

Franklin S. Wong, and Clair E. Hildebrand, both of Morris County, N.J., assignors to Allied Corporation, Morristown, N.J.

Filed Jul. 6, 1983, Ser. No. 511,368
Int. Cl.³ C07G *13/)*
U.S. Cl. 422—186.22 **8 Claims**



1. An improved plasma reactor of the falling film type, the improvement comprising

(a) a water cooled injection ring having a cylindrical passage therethrough, said passage having a first section with a first diameter joining a second section with a second diameter greater than said first diameter, said first and second sections having a common axis;

(b) a radiation barrier generated about said common axis having an inner surface of revolution which extends said first section of said passage into said second section;

(c) one or more reactant feed ports passing through said injection ring terminating in said second section in close proximity to the junction with said first section.

4,489,042

PROCESS FOR RECOVERY OF MINERAL VALUES FROM SUBTERRANEAN FORMATIONS

Joseph G. Savins, and Warren F. Johnson, both of Dallas, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 28, 1981, Ser. No. 335,296
Int. Cl.³ C22B *60/02*; C01G *43/00*; E21B *43/28*
U.S. Cl. 423—20 **15 Claims**

1. A process for the recovery of uranium values from a subterranean formation containing pyritic sulfur compounds and penetrated by injection and production systems, comprising the steps of:

(a) introducing into the formation via the injection system an aqueous solution of iron-complexing agent and an oxidant to preferentially oxidize and solubilize at least a portion of the sulfur compounds in the formation and inhibit plugging of the formation by insoluble sulfur compounds;

(b) then introducing a lixiviant comprising a uranium-leaching agent and an oxidant into the formation through the injection system;

(c) allowing the lixiviant to leach out uranium values in the formation; and

(d) producing the lixiviant and uranium values from the formation via the production system.

5. The process of claim 1 wherein the aqueous solution of iron complexing agent is maintained at an elevated temperature of about 150° F. to 400° F.

9. The process of claim 1 wherein the iron complexing agent is selected from the group consisting of carboxylic acids, and hydroxy carboxylic acids and their salts, diols and polyols, amines, amino acids and amino acid salts, amino polycarboxylic acids and their salts, phosphonic acids and their salts, condensed phosphates, and salts of condensed phosphates.

14. The process of claim 1 wherein the lixiviant is CO_2/O_2.

4,489,043

MANUFACTURE OF MANGANOUS SULFATE SOLUTIONS

Paul D. Bowerman, Edmond; Thomas W. Clapper, Oklahoma City, and William C. Laughlin, Edmond, all of Okla., assignors to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

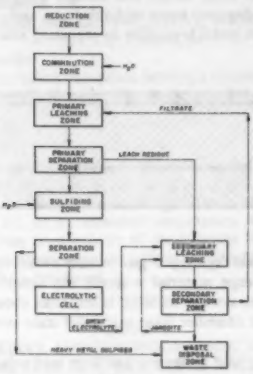
Filed Feb. 8, 1984, Ser. No. 577,996
Int. Cl.³ C01G *45/10*
U.S. Cl. 423—49 **10 Claims**

1. In a process for producing manganese sulfate solutions containing low levels of potassium impurity from manganese ores containing potassium impurity for use in the manufacture of electrolytic manganese dioxide, said process including reducing said manganese ore, combining said reduced ore with an aqueous acid solution selected from the group consisting of aqueous sulfuric acid and spent aqueous electrolyte containing sulfuric acid and digesting said combination at elevated temperatures in the presence of ferric ion to produce a manganese sulfate solution and a particulate potassium-iron salt byproduct the improvements which comprise:

A. contacting a portion of said potassium-iron salt byproduct, with a fresh combination of said reduced ore and aqueous acid to form a mixture, said mixture having a solution pH ranging from about 0.5 to about 3.5 and

B. digesting the mixture of said fresh combination and said salt byproduct at elevated temperatures to produce a

manganese sulfate solution and to enhance the reaction between the potassium impurity and ferric ion and the



removal of said potassium impurity as potassium-iron salt byproduct from the manganese sulfate solution.

4,489,044

FORMATION OF TUNGSTEN MONOCARBIDE FROM A MOLTEN TUNGSTATE-HALIDE PHASE BY GAS SPARGING

John M. Gomes, Reno; Andrea E. Raddatz, Sparks, and Elizabeth G. Baglin, Reno, all of Nev., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Continuation-in-part of Ser. No. 544,299, Oct. 21, 1983,. This application Jan. 27, 1984, Ser. No. 574,499

Int. Cl.³ C01G *41/00*

U.S. Cl. 423—53 **9 Claims**

1. A process for preparation of tungsten monocarbide comprising:

(a) providing a molten composition comprising an alkali metal halide and an oxygen compound of tungsten;

(b) sparging said composition with a gas comprising a gaseous hydrocarbon which is selected from the group consisting of natural gas, methane, ethane, acetylene, propane, butane, mixtures thereof, and admixtures of these gases with H_2 or CO, at a temperature of about 900° to 1100° C. for a sufficient time for the tungsten compound to be substantially converted to tungsten carbide; and

(c) decanting the molten halide from the tungsten carbide product.

4,489,045

RECOVERY OF BY-PRODUCT CALCIUM CHLORIDE FROM CHLORINATION OF TITANIFEROUS ORES

Theodore A. Rado, Oklahoma, Okla., assignor to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed Jun. 17, 1983, Ser. No. 505,288

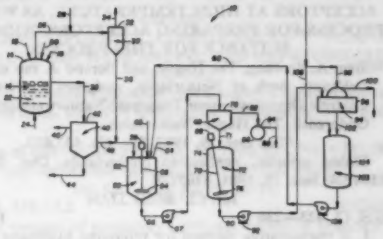
Int. Cl.³ C01F *1/00*; C22B *1/00*

U.S. Cl. 423—79 **34 Claims**

1. A process for treating metal chloride by-products produced by chlorinating metalliferous ore in a chlorination zone to produce a first product stream comprising metal chloride product and metal chloride by-products and separating the metal chloride by-products from the first product stream, comprising the steps of:

passing the metal chloride by-products to a treatment zone;

treating the metal chloride by-products with lime in the treatment zone to produce a mixture comprising hydrous



metal oxides and a solution comprising at least about 75 weight percent calcium chloride; and

recovering at least a portion of the calcium chloride.

4,489,046

METHOD FOR WORKING-UP ARSENIC-CONTAINING WASTE

Stig A. Petersson, Skelleftehamn, and Bengt S. Eriksson, Sundsvall, both of Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

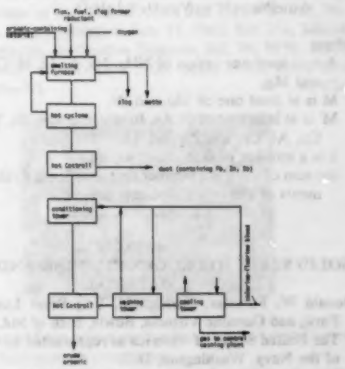
PCT No. PCT/SE81/00061, § 371 Date Oct. 1, 1981, § 102(e) Date Oct. 1, 1981, PCT Pub. No. WO81/02568, PCT Pub. Date Sep. 17, 1981

Continuation of Ser. No. 546,646, Oct. 31, 1983, abandoned, which is a continuation of Ser. No. 308,544, Oct. 1, 1981, abandoned. This PCT application Mar. 4, 1981, Ser. No. 608,269

Claims priority, application Sweden, Mar. 10, 1980, 8001847

Int. Cl.³ C01G *28/00*

U.S. Cl. 423—88 **6 Claims**



1. A method of converting an arsenic-containing waste product to a depositable, substantially arsenic-free form by fuming-off the arsenic content thereof, comprising melting the waste product under oxidizing conditions in a furnace to form an oxidic slag melt; causing turbulence of the melt, while maintaining a reducing atmosphere supporting the formation of arsenic(III)oxide at the furnace temperature; driving-off arsenic content of the waste product substantially in the form of gaseous arsenic(III)oxide; separating the formed oxide by condensation and recovering the same and removing from said furnace a substantially arsenic-free depositable slag.

4,489,047

PROCESS FOR REMOVING HYDROGEN SULPHIDE FROM PROCESS GASES USING SOLID ACCEPTORS, PROCESS FOR CYCLIC REGENERATING THE USED ACCEPTORS AT HIGH TEMPERATURE, AS WELL AS PROCESS FOR PREPARING ACCEPTORS, WHICH ARE SUITABLE FOR THIS PROCESS

Willem A. de Jong, The Hague, and Berend J. van der Linde, Delfgauw, both of Netherlands, assignors to Nederlandse Centrale Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek, The Hague, Netherlands

Filed Oct. 29, 1982, Ser. No. 437,623

Claims priority, application Netherlands, Oct. 30, 1981, 8104924; Dec. 18, 1981, 8105728

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—230 **15 Claims**

1. A regenerative method for removing hydrogen sulphide from process gases which comprises:

(a) contacting said gases with an MnO_x or iron oxide acceptor, wherein x has a value of from 1 to 1.5, and wherein said acceptor is supported on a (γ)-alumina carrier, and

(b) regenerating the acceptor by contacting the acceptor with steam at a temperature of from 300° C. to 700° C., wherein said steam contains hydrogen.

4,489,048

PROCESS FOR PRODUCING HYDROGEN AND CARBONYL SULFIDE FROM HYDROGEN SULFIDE AND CARBON MONOXIDE USING A HETEROPOLYANIONIC METAL COMPLEX CATALYST

Philip L. Kuch, Aurora, Ohio, assignor to The Standard Oil Company (Ohio), Cleveland, Ohio

Filed Dec. 10, 1982, Ser. No. 448,545

Int. Cl.³ C01B *1/03, 31/26*

U.S. Cl. 423—416 **20 Claims**

1. A process for the production of hydrogen and carbonyl sulfide, the process comprising contacting gaseous hydrogen sulfide with gaseous carbon monoxide in the presence of a catalytic amount of a heteropolyanionic metal complex of the formula:

$$A_{1\text{-}10}[M_{6\text{-}18}\,M'_{1\text{-}3}\,V_{0\text{-}2}\,O_x\,S_y].nH_2O \qquad (I)$$

where

A is at least one cation of NH_4, Na, K, Li, H, Cs, Rb, Ca, Ba and Mg;

M is at least one of Mo and W;

M' is at least one of P, As, Bi, Ce, Cu, Ge, Sn, Ti, Si, Ni, Fe, Co, Al, Cr, Th, Zn and Te;

n is a number of 0 to about 42; and

the sum of x + y is a number that satisfies the valence requirements of the other elements present.

4,489,049

SOLID STATE HYDROGEN PUMPING AND STORAGE MATERIAL

Donald W. Forester, Springfield, Va.; Peter Lubitz, Takoma Park, and Carmine Vittoria, Bowie, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 9, 1982, Ser. No. 386,465

Int. Cl.³ C01B *6/24*

U.S. Cl. 423—644 **18 Claims**

1. A solid-state material for storing hydrogen comprising:

a substrate suitable for the deposition of metal films;

a storage layer film of an amorphous binary alloy of a lanthanide and a second metal selected from the group consisting of iron, nickel and cobalt, wherein said storage layer is disposed upon said substrate; and

a palladium metal layer film overcoating said storage layer.

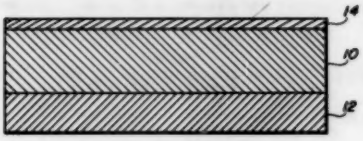
12. A method of scavenge pumping hydrogen gas from a chamber, said method comprising the steps of:

producing a solid-state storage material comprising

a substrate suitable for the deposition of metal film,

a storage layer film of an amorphous binary alloy of a lanthanide and a second metal selected from the group of consisting of iron, nickel and cobalt, wherein said storage layer is disposed upon said substrate; and

a palladium metal layer film overcoating said storage layer;



exposing said hydrogen gas in said chamber to said solid state storage material wherein the temperature of said solid state storage material is less than about 80° C.,

sealing said chamber from said solid state storage material; and

discharging said hydrogen gas from said solid state storage material by heating said solid state storage material to a temperature above about 80° C.

4,489,050

METHOD OF PREPARING A HYDROGEN-ABSORBING ALLOY

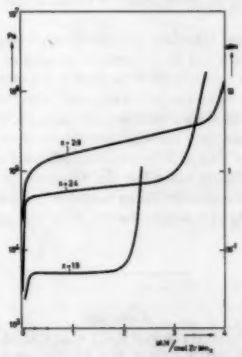
Roelof M. van Essen, and Kurt H. J. Buschow, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 241,179, Mar. 6, 1981, abandoned. This application May 20, 1983, Ser. No. 495,915

Claims priority, application Netherlands, Mar. 5, 1980, 8001314

Int. Cl.³ C01B *6/00*

U.S. Cl. 423—644 **7 Claims**



1. A method of preparing an alloy of zirconium and manganese suitable for storing hydrogen, said method comprising the steps of:

preparing a mixture consisting essentially of 64 to 77 atomic percent manganese with the remainder being zirconium;

casting the mixture to produce a casting having a melting point; and

heating the casting in a vacuum or in an inert atmosphere at a temperature between 900° and 1150° C. and below the melting point until a homogeneous single C14-type of Laves phase has been obtained.

4,489,051

SYNTHESIS OF COMPLEX BERYLLIUM HYDRIDES

Roy J. Laran, Greenwell Springs, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Jan. 23, 1984, Ser. No. 573,005
Int. Cl.³ C01B 6/24
U.S. Cl. 423—644 19 Claims

1. A process which comprises heating a mixture of beryllium hydride and an alkali metal aluminum complex of the formula

$$MAlR_mH_n$$

wherein M is an alkali metal, R is a hydrocarbyl group, m is an integer from 1 to 4, n is an integer from 0 to 3, the total of m and n being 4, said mixture having a BeH_2:$MAlR_mH_n$ mole ratio above 1:1, to an elevated temperature at which alkali metal beryllium tetrahydride of the formula M_2BeH_4 is produced so that alkali metal beryllium tetrahydride of the formula M_2BeH_4 is produced.

4,489,052

QUANTITATIVE AUTORADIOGRAPHIC MAPPING OF FOCAL HERPES SIMPLEX VIRUS ENCEPHALITIS USING A RADIOLABELED ANTIVIRAL DRUG

Richard Price, Scarsdale, N.Y., assignor to Sloan-Kettering for Cancer Research, New York, N.Y.

Filed Sep. 15, 1982, Ser. No. 418,156
Int. Cl.³ A61K 43/00, 49/00
U.S. Cl. 424—1.1 5 Claims

1. Method of mapping herpes simplex viral infection comprising administering a radiolabeled antiviral active 5-substituted

1-(2'-deoxy-2'-substituted-D-arabinofuranosyl) pyrimidine nucleoside to the infected subject, and scanning the area in which the infection is to be mapped for the radiolabel.

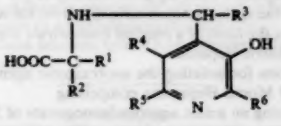
4,489,053

STABLE RADIOACTIVE DIAGNOSTIC AGENT AND A NON-RADIOACTIVE CARRIER THEREFOR

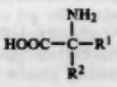
Makoto Azuma, Takarazuka, and Masaaki Hazue, Amagasaki, both of Japan, assignors to Nihon Medi-Physics Co., Ltd., Hyogo, Japan

Filed Dec. 2, 1982, Ser. No. 446,125
Claims priority, application Japan, Dec. 3, 1981, 56-195215
Int. Cl.³ A61K 43/00, 49/00
U.S. Cl. 424—1.1 4 Claims

1. A stable non-radioactive carrier for use in production of ^{99m}Tc-labeled radioactive diagnostic agent comprising a chelating agent, a water-soluble reducing agent for pertechnetate and a stabilizer chosen from ascorbic acid and erythorbic acid, and their pharmaceutically acceptable salts and esters in an amount of more than about 100 moles per 1 mol of said water-soluble reducing agent and in an amount less than that showing any material toxicity, said chelating agent comprising N-pyridoxyl-α-amino acid of the formula



wherein R^1 and R^2 are each an atom or an atomic group which can be present in α-amino acid of the formula



and R^3, R^4, R^5 and R^6 are each a hydrogen atom, a halogen atom, a C_1–C_{10} alkyl group or a C_1–C_{10} alkyl group substituted with at least one hydrophilic group, or its salt.

4,489,054

CATIONIC LIPOPHILIC COMPLEXES OF ^{99m}TC AND THEIR USE FOR MYOCARDIAL AND HEPATOBILIARY IMAGING

Edward A. Deutsch, Cincinnati, and Kenneth A. Glavan, Poland, both of Ohio, assignors to Research Corporation, New York, N.Y.

Division of Ser. No. 141,618, Apr. 18, 1980, Pat. No. 4,387,087. This application Apr. 14, 1983, Ser. No. 484,839
Int. Cl.³ A61K 43/00, 49/00
U.S. Cl. 424—1.1 24 Claims

15. A process of preparing a cationic lipophilic complex of ^{99m}Tc of the formula:

$$(L_2{}^{99m}TcX_2)X$$

wherein L is a neutral lipophilic ligand which is strongly chelating towards a ^{99m}Tc cation and which is capable of reducing Tc^{+7} to a lower valence state;

X are the same or different monovalent anionic ligands, which comprises:

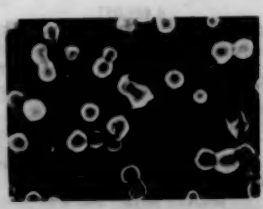
reducing a $^{99m}Tc^{+7}$ species to a lower valency state species with a ligand L, wherein the $^{99m}Tc^{+7}$ is present in an aqueous phase, wherein the ligand L is present in a water immiscible phase in intimate contact with said aqueous phase, and wherein during the reduction, said lower valency state species of ^{99m}Tc is transferred to said non-aqueous phase.

4,489,055

PROCESS FOR PREPARING BIODEGRADABLE SUBMICROSCOPIC PARTICLES CONTAINING A BIOLOGICALLY ACTIVE SUBSTANCE AND THEIR USE

Patrick Couvreur, Wezembeek-Oppem; Michel Roland, Brussels, both of Belgium, and Peter Speiser, Forch, Switzerland, assignors to N.V. Sopar S.A., Sart-Dames-Avelines, Belgium

Continuation of Ser. No. 057,767, Jul. 16, 1979, Pat. No. 4,329,332. This application Feb. 17, 1982, Ser. No. 349,545
Claims priority, application Belgium, Jul. 19, 1978, 189366
Int. Cl.³ G01N 33/48; A61J 3/00; A61K 49/00; B01J 13/02
U.S. Cl. 424—7.1 41 Claims



14. Process of treating a mammal with a biologically active substance, said process comprising

orally or parenterally administering to a mammal a biologically effective amount of biodegradable particles having a diameter less than 500 nanometers, said particles comprising a substantially spherical, dense, filamentous, polymeric network, wherein the polymeric network has dispersed therethrough the biologically active substance, and wherein said polymer is biodegradable in the mammal and is formed by the micellar polymerization of an alkyl cyanoacrylate, said alkyl group containing 1 to 4 carbon atoms, wherein the polymer particles are biodegraded to progressively release the biologically active substance into said mammal at a rate substantially corresponding to the rate of biodegradation of said polymer.

33. Process of carrying out a diagnostic test with a diagnostic agent, said process comprising

adding to a biological medium to be analyzed a diagnostically sufficient amount of biodegradable particles having a diameter less than 500 nanometers, said particles comprising a substantially spherical, dense, filamentous, polymeric network, wherein the polymeric network has dispersed therethrough a diagnostic agent, and wherein said polymer is biodegradable in the medium and is formed by the micellar polymerization of an alkyl cyanoacrylate, said alkyl group containing 1 to 4 carbon atoms, and wherein the polymer particles are biodegraded in said medium to progressively release the diagnostic agent into said medium at a rate substantially corresponding to the rate of biodegradation of said polymer.

4,489,056

ACID ANHYDRIDES AS RATE CONTROLLING AGENT FOR THE EROSION OF POLYMERS WHICH LATTER POLYMERS HAVE BENEFICIAL SUBSTANCES DISPERSED THROUGHOUT THEIR MATRIX OR WHERE THE POLYMER MATRIX SURROUNDS THE BENEFICIAL SUBSTANCE

Kenneth J. Himmelstein, and Takeru Higuchi, both of Lawrence, Kans., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 30, 1982, Ser. No. 393,990

Int. Cl.³ A61K *9/22, 9/26, 9/52, 31/74*

U.S. Cl. 424—22 **9 Claims**

1. A controlled release device for the delivery of drugs or other biological beneficial substances which comprises:

(a) A poly(orthoester);

(b) an erosion catalyzing amount up to a maximum of about 25 percent, by weight, based on (a), or at least one acid anhydride selected from the group consisting of a monobasic carboxylic anhydride, a cyclic dibasic carboxylic anhydride, and a polymeric carboxylic anhydride, incorporated within the matrix of said poly(orthoester); and

(c) an effective amount up to 70 percent, by weight, based on (a) and (b), of a drug or other biological beneficial substance incorporated within or to be surrounded by the matix of said poly(orthoester),

such that when said release device is exposed to aqueous environments, the matrix of said poly(orthoester) slowly erodes and said drug or beneficial substance is released in a controlled manner.

4,489,057

U.V. ABSORBING COSMETIC COMPOSITIONS

Reiner Welters; Juergen Gehlhaus, and Gernot Moeschl, all of Darmstadt, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschraenkter Haftung, Darmstadt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 727,806, Sep. 29, 1976, abandoned. This application May 12, 1980, Ser. No. 148,606

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1975, 2544180

Int. Cl.³ A61K *7/42, 9/12*

U.S. Cl. 424—47 **4 Claims**

1. A cosmetic composition containing a U.V. absorbing effective concentration of 4-isopropyldibenzoylmethane dissolved in the fatty components of a cosmetically acceptable oil, emulsion, cream, ointment or aerosol carrier adapted for application to human skin.

4,489,058

ACNE CONTROL METHOD

George E. Lay, Fountaintown, Ind.; Daniel H. Haigh, Sanford, Mich., and Richard A. Knipstein, Carmel, Ind., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 23, 1983, Ser. No. 497,296

Int. Cl.³ A61K *31/74, 31/78, 31/745*

U.S. Cl. 424—78 **19 Claims**

1. A method for controlling acne or acneform eruptions in humans which comprises the topical application of an effective amount of a crosslinked or uncrosslinked sebum-imbibing, sebum-retaining polymer, wherein the polymer is the polymerization product of two or three monomer units selected from the group consisting of styrene or alkylstyrene ring substituted with a straight or branched chain alkyl moiety of from 1 to about 12 carbon atoms; an alkyl ester derived from an alcohol containing from about 8 to about 20 carbon atoms and acrylic or methacrylic acid; a vinyl ester of an aliphatic carboxylic acid containing from about 8 to about 20 carbon atoms; and an aliphatic diolefin of from about 4 to about 6 carbon atoms.

4,489,059

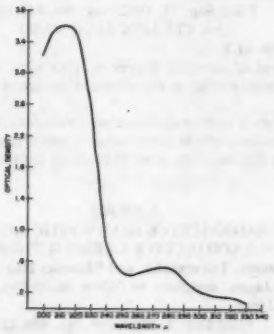
ANOREXIGENIC COMPOSITION AND METHOD

Aldo A. Rossini, 62 Rambling Rd., Sudbury, Mass. 01776; John P. Mordes, 80 Devonshire Rd., Waban, Mass. 02168; Susan E. Leeman, 139 Park St., Newton Corner, Mass. 02158; Robert E. Carraway, 17 Brentwood Dr., Holden, Mass. 01520, and Susan E. Ruane, Greenacres, Medway, Mass. 02053

Continuation of Ser. No. 375,876, May 7, 1982, abandoned. This application Jun. 21, 1983, Ser. No. 497,629

Int. Cl.³ A61K *35/407*

U.S. Cl. 424—106 **9 Claims**



1. An anorexigenic agent in purified form, characterized in that:

(a) it is present in aqueous extracts of 5123 Morris Hepatoma,

(b) it has a molecular weight within the range of 3500 to 10,000 Daltons,

(c) it is deactivated by peptidase,

(d) it is stable in aqueous solution at pH 4.5 heated at 100° C. for 10 minutes,

(e) it is strongly bound by cation exchange resins,

(f) it is not absorbed by a hydrophobic chromatographic resin,

(g) it precipitates from aqueous solution at pH 7, and

(h) it has the spectrophotometric spectrum shown in FIG. 1 when in the form of a purified concentrate derived from a 5123 Morris Hepatoma.

6. A process for isolating the anorexigenic agent of claim 1 from a 5123 Morris Hepatoma comprising

(a) extracting an acidic aqueous homogenate of 5123 Morris Hepatoma with a non-polar lipophilic solvent, separating the aqueous phase remaining to yield an initial residue,

(b) purifying an aqueous solution extract of the initial residue by applying the aqueous extract acidified to a pH of from 1.5 to 5.0 to a hydrophilic gel column and eluting the column with water acidified to a pH of from 1.5 to 5.0, and

(c) collecting the eluate corresponding to the first fractions having an optical density greater than 1.6 measured at a frequency of 280 μ and removing the solvent therefrom to yield an active concentrate.

4,489,060

METHOD OF SOLIDIFYING BILE

Kazuharu Nakazawa, 7, Chisoku, Sasayama-cho, Taki-gun, Hyogo-ken, Japan

Filed Dec. 16, 1983, Ser. No. 562,117
Int. Cl.³ A61K *35/413*
U.S. Cl. 424—106 2 Claims

1. A method of solidifying bile which comprises:
(a) concentrating pig's bile to about ½ of its original quantity,
(b) adding thereto a medical additive obtained by heating pig's bones and fats at high temperatures in two stages, the first stage being at a temperature of 700° to 1000° C. and the second stage being at a temperature of 1300° to 1400° C., in a quantity twice the quantity of the concentrated bile,
(c) heating the product of (b) at temperatures within the range from 1,300° to 1,450° C.; and
(d) allowing the product of (c) to stand at room temperature to cool down into solid bile.

4,489,061

TREATMENT OF MALE MAMMALS

Catherine L. Rivier; Jean E. F. Rivier, and Wylie W. Vale, Jr., all of La Jolla, Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Continuation of Ser. No. 272,968, Jun. 12, 1981, Pat. No. 4,377,574. This application Sep. 27, 1982, Ser. No. 423,734
The portion of the term of this patent subsequent to Mar. 22, 2000, has been disclaimed.
Int. Cl.³ A61K *37/00*
U.S. Cl. 424—177 10 Claims

1. A method for suppressing aggressiveness and desire to mate in male mammals comprising administering an effective amount of a peptide or a nontoxic salt thereof to a male mammal, at a daily dosage level of not more than about 3 milligrams per kilogram of body weight, said peptide being an LRF antagonist having an ICR_{50} of less than 1/1.

4,489,062

PHARMACEUTICAL COMPOUNDS, PREPARATION, USE AND INTERMEDIATES THEREFOR AND THEIR PREPARATION

Lawrence A. Lowe, 38 Manse Way, Swanley, Kent; Terence W. Smith, 68 Maxwell Gardens, Orpington, Kent, and Samuel Wilkinson, 12 Bevington Rd., Beckenham, Kent, all of England

Filed Feb. 4, 1983, Ser. No. 463,935
Claims priority, application United Kingdom, Feb. 5, 1982, 8203462
Int. Cl.³ A61K *37/00*; C07C *103/52*
U.S. Cl. 424—177 8 Claims

1. A peptide of formula (I)

$$X—Tyr—X^2—Gly—Phe(4NO_2)—Pro—NH_2 \quad (I)$$

or a pharmacologically acceptable salt thereof wherein
X is hydrogen or an amidino group, and
X^2 is a radical selected from D—S—methylmethionyl and D—arginyl.

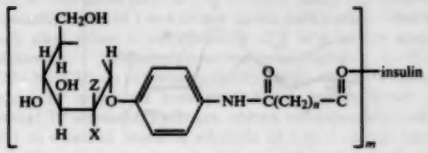
4,489,063

GLYCOSYLATED INSULIN DERIVATIVES

Wan S. Kim, 4512 Jupiter Dr., Salt Lake City, Utah 84117; Seo Y. Jeong, 716 Medical Pl., N., Salt Lake City, Utah 84112, and James C. McRea, 1876 E. 2700 S., Salt Lake City, Utah 84106

Division of Ser. No. 442,362, Nov. 17, 1982, Pat. No. 4,444,683. This application Feb. 6, 1984, Ser. No. 532,681
Int. Cl.³ A61K *37/26*
U.S. Cl. 424—178 6 Claims

1. A method of depressing the blood sugar level in a diabetic patient which comprises administering to said patient, in a pharmaceutically acceptable carrier, an effective amount of a glycosylated insulin having the formula



wherein X and Z are different and are selected from the group consisting of —H and —OH, n is an integer of 2 to 6 and m is an integer of 1 to 3 and wherein each glycosyl group is attached to the insulin by an amide linkage through one or more of the α-amino groups of the A-1 glycine, B-1 phenylalanine or ε-amino group of the B-29 lysine moieties of the insulin molecule.

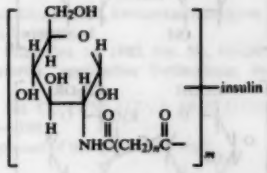
4,489,064

GLYCOSYLATED INSULIN DERIVATIVES

Wan S. Kim, 4512 Jupiter Dr., Salt Lake City, Utah 84117; Seo Y. Jeong, 716 Medical Pl., N., Salt Lake City, Utah 84112, and James C. McRea, 1876 E. 2700 S., Salt Lake City, Utah 84106

Division of Ser. No. 442,362, Nov. 17, 1982, Pat. No. 4,444,683. This application Feb. 6, 1984, Ser. No. 532,696
Int. Cl.³ A61K *37/26*
U.S. Cl. 424—178 4 Claims

1. A method of depressing the blood sugar level in a diabetic patient which comprises administering to said patient an effective predetermined amount of a glycosylated insulin of the formula



wherein n is an integer of 2 to 6, m is an integer of 1 to 3 and wherein the glycosyl group is attached to the insulin by an amide linkage through one or more of the α-amino groups of the A-1 glycine, B-1 phenylalanine, or ε-amino group of the B-29 lysine moieties of the insulin molecule, in a pharmaceutically acceptable carrier.

4,489,065

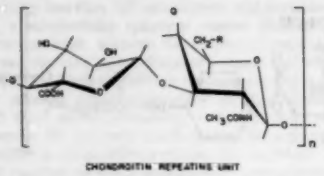
CHONDROITIN DRUG COMPLEXES

Alan G. Walton, Norwalk, Conn.; Randall V. Sparer, Lawrence, Kans., and Nnochiro Ekwuribe, Detroit, Mich., assignors to Valcor Scientific Ltd., New York, N.Y.

PCT No. PCT/US82/00879, § 371 Date Mar. 1, 1983, § 102(e) Date Mar. 1, 1983, PCT Pub. No. WO83/00150, PCT Pub. Date Jan. 20, 1983
Continuation-in-part of Ser. No. 279,724, Jul. 2, 1981, abandoned. This PCT application Jun. 30, 1982, Ser. No. 479,865
Int. Cl.³ A61K *31/70*; C08B *37/08*
U.S. Cl. 424—180 21 Claims

1. A prodrug consisting essentially of chondroitin-4-sulfate or chondroitin-6-sulfate covalently or ionically bonded to a pharmaceutically active substance of the group consisting of chloramphenicol, methotrexate, adriamycin, vinblastine, vincristine, vindesine, 6-mercaptopurine, 5-fluorouracil, the penicillin antibiotics, the cephalosporin antibiotics, and the 1-

oxacephalosporin antitiotics and having the property, when injected into animal tissue, of undergoing natural conversion in



CHONDROITIN REPEATING UNIT

the physiological environment to provide controlled release of the pharmaceutically active substance or an active complex thereof.

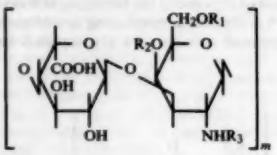
4,489,066

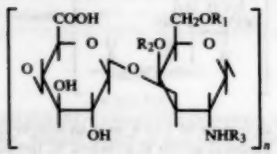
ARTERIAL POLYSACCHARIDE COMPLEX, A METHOD FOR ITS PREPARATION AND COMPOSITION COMPRISING SAME

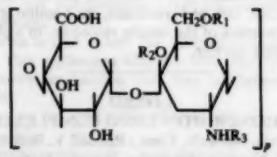
Gianfranco Fedeli, Milan, Italy, assignor to Mediolanum Farmaceutici S.r.L., Milan, Italy

Filed Jul. 10, 1978, Ser. No. 877,700
Claims priority, application Italy, Feb. 14, 1977, 20261
Int. Cl.³ A61K *31/73*; C08B *37/00*; C07H *5/06*
U.S. Cl. 424—181 **7 Claims**

1. An arterial polysaccharide complex of the formula:







wherein R_1 and R_2 represent hydrogen, sulfur or acetyl, R_3 represents —SO_3H or —CO—CH_3 and m, n and p are integers which define a molecular weight of 10,000 to 30,000 daltons for the polysaccharide chains and the nontoxic pharmacologically acceptable acid addition salts thereof.

2. A polysaccharide complex according to claim **1** consisting of hexosamine glycanmonosulphates derived from the aorta of young mammals, and having the following characteristics:

(a) on acid hydrolysis it liberates hexosamine and uronic acids in the molar ratio of approximately 1/1, together with variable quantities of nucleosides;

(b) electrophoretically, it separates into three anionic bands which can be seen with Alcian Blau and Toluidine Blue;

(c) it reacts with alkaline and alkaline earth metal bases to form salts soluble in water, whereas with the aliphatic ammonium ion it forms salts insoluble in water;

(d) its sodium salt is soluble to the extent of 2% in 50% ethyl alcohol, whereas its acid form is soluble to the extent of 2% in 70% ethyl alcohol;

(e) it reacts with Toluidine Blue to give a minimum metachromatic reaction;

(f) spectrophotometrically it shows a maximum at 260±nm; and

(g) it has a rotatory power on polarised light of −11° to −22°.

4. A method for the treatment of arteriopathies which comprises administering to a host a therapeutically effective amount of the arterial polysaccharide complex of claim **1** or claim **2**.

4,489,067

LIPID REDUCING AGENTS

Fukuji Uenobe, Toyonaka; Shin Matsuura, Gifu; Nobuhiro Yamamoto, Sakai, and Masakazu Shioyama, Hirakata, all of Japan, assignors to Yushiro Chemical Industry Co., Ltd., Osaka, Japan

PCT No. PCT/JP81/00091, § 371 Date Dec. 16, 1981, § 102(e) Date Dec. 16, 1981
PCT Filed Apr. 21, 1981, Ser. No. 333,865
Claims priority, application Japan, Apr. 21, 1980, 55-051613
Int. Cl.³ A61K *35/78*
U.S. Cl. 424—195 **16 Claims**

1. An agent for reducing the amount of cholesterol in serum and in the liver which is obtained by drying and powdering the stems and rootstocks of *Yucca mohavensia*, dissolving the powder in a lower dialkyl ether, discarding the ether-soluble portion, extracting the ether-insoluble portion with a lower alcohol from the extract and drying the residue.

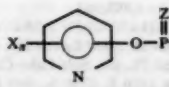
4,489,068

METHOD AND COMPOSITION FOR ENHANCING THE INSECTICIDAL ACTIVITY OF CERTAIN ORGANOPHOSPHORUS COMPOUNDS

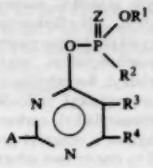
Donald H. De Vries, Concord; Walter Reifschneider, Walnut Creek, and Mark J. Costales, Concord, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 28, 1983, Ser. No. 489,421
Int. Cl.³ A01N *57/16*, *57/32*; C07F *9/65*
U.S. Cl. 424—200 **32 Claims**

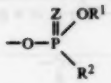
1. An insecticidal composition which comprises an inert carrier and an insecticidally effective amount of an active mixture of toxicants which mixture comprises about 1 part by weight of a pyridinyl phosphorus insecticide corresponding to the formula



wherein each X independently represents bromo, chloro, fluoro or iodo; Z represents oxygen or sulfur; each R independently represents alkoxy of 1 to 4 carbon atoms and n represents an integer of from 1 to 3 in admixture with from about 1/16 part to about 16 parts by weight of a pyrimidinyl compound corresponding to the formula

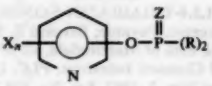


wherein A represents hydrogen, alkyl of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, allylthio, cycloalkyl of 3 or 4 carbon atoms, alkyl(cycloalkyl) wherein the alkyl group is of 1 to 4 carbon atoms and the cycloalkyl group is of 3 or 4 carbon atoms, (cycloalkyl)alkyl wherein the alkyl group is of 1 to 4 carbon atoms and the cycloalkyl group is of 3 or 4 carbon atoms, phenyl, trifluoromethyl, dialkylamino wherein each alkyl group is independently of 1 to 4 carbon atoms or morpholino; R^4 represents hydrogen, chloro, trifluoromethyl, alkyl of 1 to 4 carbon atoms or alkylthio of 1 to 4 carbon atoms (alkylthio)alkyl wherein each alkyl group is independently of 1 to 4 carbon atoms, alkoxyalkyl wherein the alkoxy and alkyl groups are independently of 1 to 4 carbon atoms, cycloalkyl of 3 or 4 carbon atoms or a group of the formula

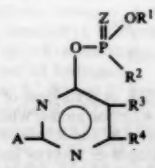


R^1 represents alkyl of 1 to 4 carbon atoms; R^2 represents monoalkylamino of 1 to 4 carbon atoms, dialkylamino wherein each alkyl group is independently of 1 to 4 carbon atoms, allylamino, ((dimethylamino)methylene)amino (—N=-CH—N(CH$_3$)$_2$ or monocycloalkylamino of 3 to 4 carbon atoms; R^3 represents hydrogen, chloro, bromo, fluoro or methyl and Z is oxygen or sulfur.

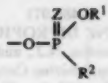
18. A method for killing and controlling insects of the genus Heliothis which comprises contacting said insects or their habitat with an insecticidally effective amount of a composition which comprises an inert carrier in intimate admixture with an active mixture of toxicants which mixture comprises about 1 part by weight of a pyridinyl phosphorus insecticide corresponding to the formula



wherein each X independently represents bromo, chloro, fluoro or iodo; Z represents oxygen or sulfur; each R independently represents alkoxy of 1 to 4 carbon atoms and n represents an integer of from 1 to 3 in admixture with from about 1/16 part to about 16 parts by weight of a pyrimidinyl compound corresponding to the formula



wherein A represents hydrogen, alkyl of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, allylthio, cycloalkyl of 3 or 4 carbon atoms, alkyl(cycloalkyl) wherein the alkyl group is of 1 to 4 carbon atoms and the cycloalkyl group is of 3 or 4 carbon atoms, (cycloalkyl)alkyl wherein the alkyl group is of 1 to 4 carbon atoms and the cycloalkyl group is of 3 or 4 carbon atoms, phenyl, trifluoromethyl, dialkylamino wherein each alkyl group is independently of 1 to 4 carbon atoms or morpholino; R^1 represents alkyl of 1 to 4 carbon atoms; R^2 represents monoalkylamino of 1 to 4 carbon atoms, dialkylamino wherein each alkyl group is independently of 1 to 4 carbon atoms, allylamino, ((dimethylamino)methylene)amino (—N=-CH—N=CH$_3$=$_2$ or monocycloalkylamino of 3 to 4 carbon atoms; R^3 represents hydrogen, chloro, bromo, fluoro or methyl; R^4 represents hydrogen, chloro, trifluoromethyl, alkyl of 1 to 4 carbon atoms or alkylthio of 1 to 4 carbon atoms (alkylthio)alkyl wherein each alkyl group is independently of 1 to 4 carbon atoms, alkoxyalkyl wherein the alkoxy and alkyl groups are independently of 1 to 4 carbon atoms, cycloalkyl of 3 or 4 carbon atoms or a group of the formula



and Z is oxygen or sulfur.

4,489,069

SUBSTITUTED THIAZOLIDINYL ESTERS OF MINERAL ACIDS

Angelo Storni, Rheinfelden, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

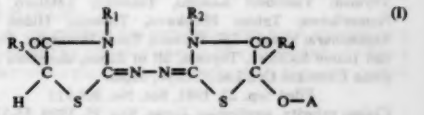
Filed Oct. 14, 1982, Ser. No. 434,304

Claims priority, application Switzerland, Jan. 22, 1982, 406/82

Int. Cl.^{3} **C07D** *417/12;* **A61K** *31/425*

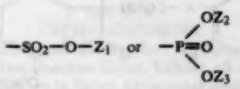
U.S. Cl. 424—202 **22 Claims**

1. A compound of the general formula



(I)

in which one of the symbols R_1 and R_2 represents an alkyl radical that has 3 or 4 carbon atoms and is unsaturated in the 2,3-position, and the other represents such a radical or lower alkyl, R_3 and R_4 each represents, independently of the other, hydrogen or methyl, and A represents a radical of the formula



(Ia) (Ib)

in which Z_1, or each of Z_2 and Z_3 independently of the other, represents hydrogen or lower alkyl, or Z_2 and Z_3 together represent lower alkylene, and salts of such compounds in which Z_1, or Z_3 and optionally also Z_2, represent(s) hydrogen.

4,489,070

BETAMETHASONE DIPROPIONATE CREAM

Varda E. Sandweiss, Forest Hills, N.Y.; Elliot Stupak, and Paul H. Shapiro, both of West Caldwell, N.J., assignors to Schering Corporation, Madison, N.J.

Continuation-in-part of Ser. No. 494,214, May 13, 1983,. This application Nov. 10, 1983, Ser. No. 550,434

The portion of the term of this patent subsequent to Nov. 13, 2001, has been disclaimed.

Int. Cl.[3] A61K *31/56*

U.S. Cl. 424—243 4 Claims

1. A topical pharmaceutical composition for the treatment of inflammation consisting essentially of 0.02 to 0.10 percent betamethasone dipropionate; 0 to 0.6 percent titanium dioxide; 1.0 to 2.5 percent Carbomer 940; sufficient base to adjust the pH to between pH 4 to pH 5.5; and about 60 to 80 percent of propylene glycol and about 20 to 40 percent water.

4,489,071

BETAMETHASONE DIPROPIONATE CREAM

Richard K. Florance, Boonton, N.J., and Joel A. Sequeira, New York, N.Y., assignors to Schering Corporation, Madison, N.J.

Filed Dec. 9, 1983, Ser. No. 559,671

Int. Cl.[3] A61K *31/56*

U.S. Cl. 424—243 8 Claims

1. An elegant topical composition for the treatment of inflammation comprising by weight based on the total weight of the composition:

(a) 0.02 to 0.1 percent betamethasone dipropionate,

(b) 15 to 40 percent white petrolatum,

(c) 3 to 15 percent white wax,

(d) 5 to 25 percent solution of 70% sorbitol in water,

(e) 2.5 to 15 percent propylene glycol,

(f) buffer to maintain the pH of the composition within the range of 3 to 6,

(g) sufficient amounts at least one hydrophilic emulsifier and at least one lipophilic emulsifier to stabilize the emulsion and disperse the betamethasone dipropionate, wherein the HLB of the emulsifier is within the range of 2 to 8,

(h) sufficient dermatologically acceptable preservative to prevent degradation of the composition by microorganisms, and

(i) water.

4,489,072

CEPHALOSPORINS

Hiroshi Sadaki; Hirokazu Narita; Hiroyuki Imaizumi, all of Toyama; Yoshinori Konishi, Takaoka; Takihiro Inaba, Namerikawa; Tatsuo Hirakawa, Toyama; Hideo Taki, Sagamihara; Masaru Tai, Toyama; Yasuo Watanabe, Toyama, and Isamu Saikawa, Toyama, all of Japan, assignors to Toyama Chemical Co., Ltd., Tokyo, Japan

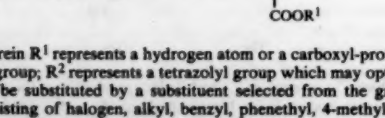
Filed Sep. 23, 1981, Ser. No. 304,912

Claims priority, application Japan, Sep. 25, 1980, 55-132253; Nov. 12, 1980, 55-158184; Dec. 13, 1980, 55-175263

Int. Cl.[3] A61K *31/545*; C07D *501/56*

U.S. Cl. 424—246 30 Claims

1. A cephalosporin represented by the following formula or a salt thereof:



wherein R^1 represents a hydrogen atom or a carboxyl-protecting group; R^2 represents a tetrazolyl group which may optionally be substituted by a substituent selected from the group consisting of halogen, alkyl, benzyl, phenethyl, 4-methylbenzyl, naphthylmethyl, phenyl, naphthyl, indanyl, alkenyl, hydroxyl, oxo, alkoxy, alkylthio, nitro, cyano, amino, alkylamino, dialkylamino, carboxylic acylamino, carboxylic acyl, carboxylic acyloxy, carboxylic acylalkyl, carboxyl, alkoxycarbonyl, carbamoyl, aminoalkyl, N-alkylaminoalkyl, N,N-dialkylaminoalkyl, hydroxyalkyl, hydroxyiminoalkyl, alkoxyalkyl, carboxyalkyl, alkoxycarbonylalkyl, benzyloxycarbonylalkyl, phenethyloxycarbonylalkyl, 4-methylbenzyloxycarbonylalkyl, naphthylmethyloxycarbonylalkyl, sulfoalkyl, sulfo, sulfamoylalkyl, sulfamoyl, carbamoylalkyl, carbamoylalkenyl, and N-hydroxycarbamoylalkyl, or a triazolyl group which may optionally be substituted by one or two substituents selected from the above-mentioned groups, said tetrazolyl or triazolyl group being attached to the exomethylene group at the 3-position of the cephem ring through a carbon-nitrogen bond; R^3 represents a hydrogen or halogen atom; R^4 represents a hydrogen atom or an amino group which may optionally be protected, or optionally substituted by at least one substituent selected from the group consisting of alkyl, alkenyl, cycloalkyl, phenyl, naphthyl, indanyl, benzyl, phenethyl, 4-methylbenzyl, naphthylmethyl, heterocyclic and heterocyclic alkyl wherein said heterocyclic is selected from the group consisting of furyl, thienyl, pyrrolyl, pyrazolyl, imidazolyl, thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, thiadiazolyl, oxadiazolyl, thiatriazolyl, oxatriazolyl, triazolyl, tetrazolyl, pyridyl, 3-(2-methyl-4-pyrrolinyl), 3-(4-pyrrolinyl), N-(methylpiperidinyl), quinolyl, phenazinyl, 1,3-benzodioxolanyl, benzofuryl, benzothienyl, benzoxazolyl, benzothiazolyl and coumarinyl; A represents a group of the formula, $—CH_2—$, or a group of the formula,

in which R^5 represents a hydrogen atom or an alkyl group and the bond ~~~~ means that the compound may be a syn isomer or an anti-isomer or a mixture thereof; and B represents a hydrogen atom or a lower alkoxy group.

30. A pharmaceutical composition useful for treating bacterial infections in humans and animals, which comprises an antibacterially effective amount of a cephalosporin or a pharmaceutically acceptable salt thereof as claimed in claim **1**, **11** or **17**, in combination with a pharmaceutically acceptable inert diluent or carrier.

4,489,073

1,3,4-THIADIAZIN-5-ONES

Rodney B. Hargreaves, Poynton; Bernard J. McLoughlin, and Stuart D. Mills, both of Macclesfield, all of England, assignors to Imperial Chemical Industries, PLC, London, England

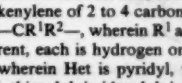
Filed Nov. 3, 1982, Ser. No. 438,728

Claims priority, application United Kingdom, Nov. 12, 1981, 8134174

Int. Cl.[3] A61K *31/54, 31/44*; C07D *417/04, 417/06*

U.S. Cl. 424—246 14 Claims

1. A heterocyclic compound of the formula:



wherein A is a direct link, or is alkylene of 1 to 4 carbon atoms or alkenylene of 2 to 4 carbon atoms; wherein X is —S— and Y is $—CR^1R^2—$, wherein R^1 and R^2 which may be the same or different, each is hydrogen or alkyl or up to 4 carbon atoms; and wherein Het is pyridyl, thienyl, furyl, pyrrolyl, pyrimidinyl, thiazolyl, imidazolyl, indolyl, benzothienyl, benzofuryl, quinolyl, isoquinolyl or quinoxalinyl which may be unsubstituted or may bear one or two substituents selected from:

halogen, cyano, nitro, trifluoromethyl;

amino, alkylamino and dialkylamino wherein the one or two alkyls each is of up to 4 carbon atoms;
alkyl and alkoxy each of up to 4 carbon atoms;
hydroxy, oxo (if on carbon next to nitrogen) and oxy (if on nitrogen or sulphur);
substituents of the formula

$$-CZOR^6$$

$$-CZNR^7R^8$$

$$-SO_2R^7R^8$$

wherein Z is oxygen or sulphur and wherein R^6, R^7 and R^8, which may be the same or different, each is hydrogen, alkyl, alkenyl, cycloalkyl or alkoxyalkyl each of up to 6 carbon atoms, or aryl or arylalkyl each of up to 12 carbon atoms, or wherein R^7 and R^8 together with the adjacent nitrogen atom for a 5- or 6-membered fully-saturated heterocyclic ring;
or a salt thereof where appropriate.

14. A method for the treatment of acute or chronic heart failure, in a warmblooded animal in need of such treatment, which comprises administering to said animal an effective amount of a heterocyclic compound claimed in claim 1.

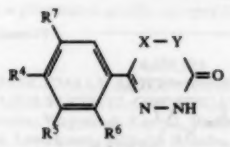
4,489,074

1,3,4-THIADIAZIN-2-ONES

David Brown, Macclesfield; Rodney B. Hargreaves, Poynton; Bernard J. McLoughlin, and Stuart D. Mills, both of Macclesfield, all of England, assignors to Imperial Chemical Industries, PLC, London, England

Filed Nov. 12, 1982, Ser. No. 440,857
Int. Cl.³ C07D *285/16;* A61K *31/54*
U.S. Cl. 424—246 **9 Claims**

1. A heterocyclic compound of the formula



wherein X is $—CR^1R^2$ and Y is —S— wherein R^1 and R^2 which may be the same or different, each is hydrogen or alkyl of up to 4 carbon atoms;
wherein either R^4 is hydrogen, fluoro or chloro, or alkyl, alkenyl, halogenoalkyl, aminoalkyl, hydroxyalkyl, alkoxyalkyl or alkoxy each of up to 6 carbon atom, and R^5, R^6 and R^7, which may be the same or different, each is hydrogen, fluoro, chloro, bromo or iodo, or alkyl, alkenyl, halogenoalkyl, aminoalkyl, hydroxyalkyl, alkoxyalkyl or alkoxy each of up to 6 carbon atoms, provided that R^4, R^5, R^6 and R^7 are not all hydrogen;
or R^4 is bromo and R^5, R^6 and R^7 have the meanings stated above, provided that R^5, R^6 and R^7 are not all hydrogen;
or R^4 and R^5 together, or R^5 and R^6 together, or R^4 and R^7 together, form the —CH=CH—CH=CH— group and the other two of R^4, R^5, R^6 and R^7 have the meanings stated above.

9. A method for the treatment of acute or chronic heart failure in a warm-blooded animal in need of such treatment, which comprises administering to said animal an effective amount of a heterocyclic compound claimed in claim 1.

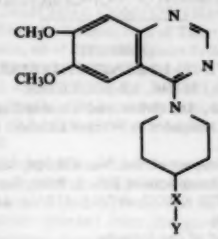
4,489,075

CYCLIC SULFONAMIDOALKYL SUBSTITUTED 4-PIPERIDINOQUINAZOLINE CARDIAC STIMULANTS

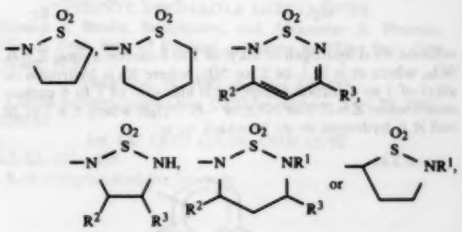
Simon F. Campbell, Deal; David A. Roberts, Sandwich, and John K. Stubbs, Deal, all of England, assignors to Pfizer Inc., New York, N.Y.

Filed Apr. 27, 1983, Ser. No. 489,271
Claims priority, application United Kingdom, May 15, 1982, 8214206
Int. Cl.³ C07D *417/14;* A61K *31/54, 31/505, 31/445*
U.S. Cl. 424—246 **25 Claims**

1. A quinazoline compound of the formula:



or a pharmaceutically acceptable salt thereof;
wherein
X is a straight or branched chain alkylene group having a total of from 1 to 4 carbon atoms; and
Y is a group of the formula:



where R^1 is H or C_1–C_4 alkyl and R^2 and R^3 are each independently H or CH_3.

13. A composition for stimulating the heart comprising a heart-stimulating effective amount of a compound of claim 1 together with a pharmaceutically acceptable diluent or carrier.

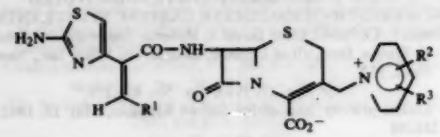
4,489,076

CEPHALOSPORINS

Günther Kinast; Michael Boberg; Karl G. Metzger, all of Wuppertal, and Hans-Joachim Zeiler, Velbert, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 17, 1983, Ser. No. 542,833
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1982, 3239365
Int. Cl.³ C07D *501/38;* A61K *31/545*
U.S. Cl. 424—246 **12 Claims**

1. A compound of the formula



in which

R^1 is C_1–C_6-alkyl, phenyl of halogen-substituted phenyl, and R^2 and R^3 each independently is H, C_1–C_4-alkyl, chlorine, bromine, carbamoyl or N-C_1–C_4-alkylcarbamoyl.

4,489,077

3-ISOXA-ZOLYL-2H-1,2-BENZOTHIAZINE-3-CARBOXAMIDE, 1,1-DIOXIDES

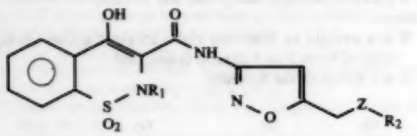
Jagadish C. Sircar, Ann Arbor, and Thomas Capiris, Plymouth, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 478,016, Mar. 23, 1983, abandoned. This application Feb. 2, 1984, Ser. No. 575,411

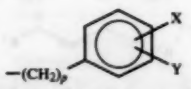
Int. Cl.[3] **C07D** *413/12, 417/12, 417/14;* **A61K** *31/54*

U.S. Cl. 424—246 **30 Claims**

1. A compound of the formula:



wherein R_1 is hydrogen or alkyl of 1 to 6 carbon atoms; Z is 0, SO_m where m is 0, 1, or 2, or NR_3 where R_3 is hydrogen or alkyl of 1 to 6 carbon atoms; R_2 is alkanoyl of 1 to 6 carbon atoms when Z is 0, S or NR_3; or $—(CH_2)_nR$ where n is 1 to 10 and R is hydrogen or Ar in which Ar is



where p is 0 to 10 and X and Y are independently hydrogen, halogen, alkyl of 1 to 6 carbon atoms, trifluoromethyl, alkoxy of 1 to 4 carbon atoms, lower alkylthio of 1 to 4 carbon atoms or hydroxy; or R_3R_2 combine with N to form pyrrolidine, piperidine, piperazine, morpholine or thiomorpholine, and pharmaceutically acceptable metal or amine salts thereof.

29. A pharmaceutical composition for treating pain resulting from inflammation comprising an effective amount of a compound as claimed in claim 1 in admixture with an inert pharmaceutical carrier.

4,489,078

DIAZAHETEROCYCLOPURINES USED AS ANTI-BRONCHO SPASMATICS AND VASODILATORS

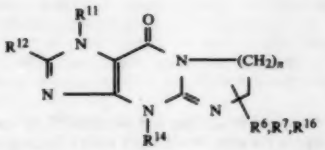
Davis L. Temple, Jr., Evansville, Ind., assignor to Mead Johnson & Company, Evansville, Ind.

Division of Ser. No. 209,791, Nov. 24, 1980, Pat. No. 4,366,156, which is a division of Ser. No. 017,771, Mar. 5, 1979, Pat. No. 4,298,734, which is a continuation-in-part of Ser. No. 869,203, Jan. 13, 1978, abandoned, which is a continuation-in-part of Ser. No. 768,291, Feb. 14, 1977, abandoned. This application Sep. 27, 1982, Ser. No. 423,888

Int. Cl.[3] **A61K** *31/505*

U.S. Cl. 424—251 **32 Claims**

1. The method for relieving bronchospasm in a mammal suffering therefrom which comprises administering to said mammal a non-toxic bronchodilator effective dose of a compound selected from the group consisting of



Formula XX'

wherein

R^{11} is hydrogen or lower alkyl up to 8 carbon atoms,

R^{12} is hydrogen, lower alkyl up to 8 carbon atoms or halogen when R_{11} is hydrogen,

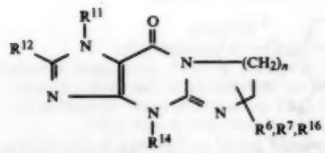
R_{14} is selected from the group consisting of lower alkyl having up to 8 carbon atoms, cycloalkylalkyl having 4 to 12 carbon atoms, pyridylmethyl, aralkyl or substituted aralkyl having 7 to 12 carbon atoms, aryloxyalkyl or substituted aryloxyalkyl having 8 to 12 carbon atoms wherein each of said substituted aralkyl and substituted aryloxyalkyl groups contains 1 or 2 non-sterically hindered ring substituents selected from halogen and alkoxy having up to 6 carbon atoms,

R^6 and R^7 are attached to ring carbon atoms and are selected from hydrogen, methyl, and ethyl,

R^{16} represents hydrogen or a double bond between adjacent ring carbon atoms,

n is the integer 1 and the pharmaceutically acceptable acid addition salts thereof.

2. The method for exerting a vasodilator effect in a mammal which comprises administering to a mammal in need of vasodilation a non-toxic vasodilator effective dose of a compound selected from the group consisting of



Formula XX'

wherein

R^{11} is hydrogen or lower alkyl up to 8 carbon atoms,

R^{12} is hydrogen, lower alkyl having up to 8 carbon atoms or halogen when R^{11} is hydrogen,

R^{14} is selected from the group consisting of lower alkyl having up to 8 carbon atoms, cycloalkylalkyl having 4 to 12 carbon atoms, pyridylmethyl, aralkyl or substituted aralkyl having 7 to 12 carbon atoms, aryloxyalkyl or substituted aryloxyalkyl having 8 to 12 carbon atoms wherein each of said substituted aralkyl and substituted aryloxyalkyl groups contains 1 or 2 non-sterically hindered ring substituents selected from halogen and alkoxy having up to 6 carbon atoms,

R^6 and R^7 are attached to ring carbon atoms and are selected from hydrogen, methyl, and ethyl,

R^{16} represents hydrogen or a double bond between adjacent ring carbon atoms,

n is the integer 1 and the pharmaceutically acceptable acid additon salts thereof.

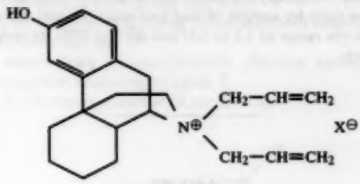
4,489,079

PHARMACEUTICAL COMPOSITIONS HAVING A PERIPHERAL ANTAGONISTIC ACTION WITH RESPECT TO OPIATES

Antonina Giudice, Milan, Italy; Claude Moulineau, Montpellier, France; Luciano Manara, Pietra Marazzi, and Paolo Carminati, Milan, both of Italy, assignors to Sonofi, Paris, France

Filed Sep. 24, 1982, Ser. No. 422,568
Claims priority, application France, Oct. 19, 1981, 81 19607
Int. Cl.³ A61K 31/485
U.S. Cl. 424—260 2 Claims

1. A method for treating the secondary effects of opiates in mamallian hosts comprising administrating to said mammalian hosts a pharmaceutically effective amount of a hallollylate of a levallorphan of the formula:



where x is chlorine, bromine or iodine.

4,489,080

PROCESS FOR ANALGESIC TREATMENT

Pavel L. Lomen, Plainwell, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 277,557, Jul. 26, 1981, abandoned. This application Dec. 6, 1982, Ser. No. 447,051
Int. Cl.³ A61K 31/19, 31/135, 31/445/31/485
U.S. Cl. 424—260 10 Claims

1. In the process of treating pain by the systemic administration of analgetic amounts of narcotic analgesics the improvement comprising the step of concomitant systemic administration of an analgetic amount of 3-fluro-4-phenylhydratropic acid or an alkyl ester of from one to eight carbon atoms, inclusive, or a pharmacologically acceptable salt, thereof.

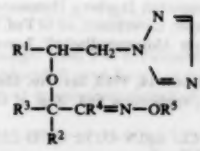
4,489,081

FUNGICIDALLY ACTIVE NOVEL SUBSTITUTED AZOLYLETHYL OXIMINOALKYL ETHERS

Jörg Stetter, Wuppertal; Karl H. Büchel, Burscheid; Paul Reinecke, Leverkusen; Wilhelm Brandes, Leichlingen, and Paul-Ernst Frohberger, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 22, 1983, Ser. No. 468,820
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1982, 3208194
Int. Cl.³ A01N 43/64, 43/48; C07D 233/60, 249/08
U.S. Cl. 424—269 7 Claims

1. A substituted azolylethyl oximinoalkyl ether of the formula



in which

R^1 is phenyl optionally monosubstituted or independently disubstituted by fluorine, chlorine, bromine, methyl, ethyl, methoxy, trifluoromethyl or trifluoromethoxy;

R^2, R^3 and R^4 each independently is hydrogen, methyl, ethyl, isopropyl, or any of the possibilities for R^1; and

R^5 is hydrogen, methyl, ethyl, isopropyl, n-propyl, n-butyl, sec.-butyl, tert.-butyl, vinyl, allyl, propargyl, or phenyl or benzyl each of which is optionally monosubstituted or independently disubstituted by fluorine, chlorine, bromine, methyl, ethyl, methoxy, trifluoromethyl or trifluoromethoxy.

4,489,082

FUNGICIDAL COMPOSITION

Yukio Ishiguru; Hirotaka Takano, both of Takarazuka, and Yuji Funaki, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 11, 1983, Ser. No. 483,615
Claims priority, application Japan, Apr. 20, 1982, 57-66488
Int. Cl.³ A01N 43/48, 43/64, 43/72
U.S. Cl. 424—269 3 Claims

1. A fungicidal composition which comprises an inert carrier and as an active ingredients (E)-1-(2,4-dichlorophenyl)-4,4-dimethyl-2-(1,2,4-triazol-1-yl)-1-penten-3-ol and an N-haloalkylthioimide fungicide selected from the group consisting of N-(trichloromethylthio)-4-cyclohexene-1,2-dicarboximide fungicide, N-(1,1,2,2-tetrachloroethylthio)-4-cyclohexane-1,2-dicarboximide fungicide and N-(trichloromethylthio)phthalimide fungicide in the ratio of 1:1 to 1:10 by weight in a total amount of 0.1 to 99.9% by weight of the composition.

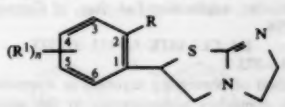
4,489,083

PHENYL IMIDAZOLE DERIVATIVES

Bernard J. Banks, Broadstairs, and Alexander B. Penrose, North Deal, both of England, assignors to Pfizer Inc., New York, N.Y.

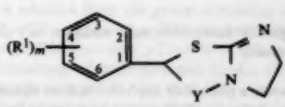
Filed Nov. 18, 1982, Ser. No. 442,685
Claims priority, application United Kingdom, Nov. 25, 1981, 8135453
Int. Cl.³ C07D 513/04; A01N 43/90
U.S. Cl. 424—270 14 Claims

1. A compound of the formula:



and the non-toxic acid addition salts thereof, wherein $(R^1)_n$ is located at the 3- or 6-position of the benzene ring and n is 1, and R and R^1 are each methyl.

4. A method of combatting ectoparasite infestations in an animal, which comprises administering to said animal an ectoparasiticidal-effective amount of a compound selected from the group consisting of bicyclic imidazole or imidazoline bases of the formula:



and the non-toxic acid addition salts thereof, wherein $(R^1)_m$ represents up to four optional substituents, m being zero or an integer of from 1 to 4, and each R^1 is independently selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, halogen, trifluoromethyl, nitro, cyano, phenyl, phenoxy, $—NH_2$, $—NHCOCH_3$, —OH, $—CH_2OH$, $—CH_2OCH_3$, —CHO, —COOH, —COO(C_1–C_4 alkyl),

—$CONH_2$ and —$SO_2N(C_1$–C_4 alkyl)$_2$; or R^1 and R^1, when taken together, represent a —CH=CH—CH=CH—, —$(CH_2)_3$— or —$(CH_2)_4$— group attached to adjacent positions of the benzene ring; and Y is —$(CH_2)_2$— or —CHR^2—, with R^2 being hydrogen or methyl; and the dashed line represents an optional bond.

4,489,084

[1-(2-OXAZOLYL) OR -(2-THIAZOLYL) HYDRAZINO]ALKYL NITRILES

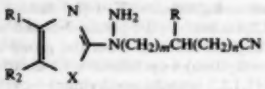
Fortuna Haviv, Deerfield, and Francis A. J. Kerdesky, Vernon Hills, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Jun. 30, 1983, Ser. No. 509,750

Int. Cl.[3] **C07D** *263/20, 277/38;* **A61K** *31/42, 31/425*

U.S. Cl. 424—270 **23 Claims**

1. A compound of the formula



wherein R is hydrogen or loweralkyl, R_1 and R_2 independently of one another denote hydrogen, loweralkyl, or phenyl or naphthyl substituted with halo, loweralkyl or loweralkoxy, X is oxygen or sulfur, n and m are each an integer from 0 to 3 inclusive, or pharmaceutically acceptable salts thereof.

4,489,085

ANTIMICROBIAL AGENTS AND THEIR USE EMPLOYING IMIDAZOLYL-ENAL ETHERS

Wilfried Draber; Karl H. Büchel; Manfred Plempel, and Ingo Haller, all of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

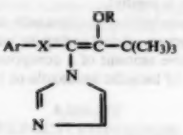
Filed Jul. 25, 1980, Ser. No. 172,331

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1979, 2931778

Int. Cl.[3] **A61K** *31/415, 31/555*

U.S. Cl. 424—273 R **3 Claims**

1. A method of combating mycoses in warm-blooded animals which comprises administering to the animals an antimycotically, effective amount of a compound which is an imidazolylenol ether of the formula



(I)

a physiologically acceptable acid addition salt or metal salt complex thereof,

in which

Ar represents a phenyl or naphthyl radical optionally substituted by halogen; alkyl with 1 to 6 carbon atoms; alkoxy with 1 to 4 carbon atoms; halogenoalkyl with 1 to 4 carbon atoms and 1 to 5 halogen atoms; nitro, cyano; or phenyl which is optionally substituted by halogen,

R represents an alkyl group with 1 to 4 carbon atoms, and

X represents an oxygen atom or a methylene radical,

either alone or in admixture with an inert pharmaceutical carrier on in the form of a medicament.

4,489,086

SOIL FUNGICIDAL AGENT FOR AGRICULTURE AND HORTICULTURE

Taizo Nakagawa, Ageo; Shozo Matsumoto, Omiya, and Kaoru Ohmori, Okegawa, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP82/00028, § 371 Date Sep. 16, 1982, § 102(e) Date Sep. 16, 1982, PCT Pub. No. WO82/02648, PCT Pub. Date Aug. 19, 1982

PCT Filed Jan. 29, 1982, Ser. No. 425,091

Claims priority, application Japan, Jan. 31, 1981, 56-12246

Int. Cl.[3] **A01N** *47/38, 47/28, 47/22, 47/10*

U.S. Cl. 424—273 R **3 Claims**

1. An agricultural and horticultural soil fungicidal composition comprising: (i) as the effective components, 4 to 95% by weight of 4-methylsulfonyloxyphenyl-N-methylthiol-carbamate and 1-isopropylcarbamoyl-3-(3,5-dichlorophenyl)hydantoin, the ratio by weight of said carbamate to said hydantoin being in the range of 1:1 to 5:1; and (ii) 5 to 96% by weight of adjuvants.

4,489,087

SPERMICIDAL THIOKETAL SUBSTITUTED N-ALKYL IMIDAZOLES

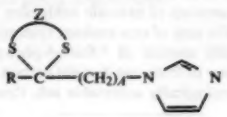
Keith A. M. Walker, Los Altos Hills, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Oct. 13, 1982, Ser. No. 434,088

Int. Cl.[3] **A61K** *31/415;* **C07D** *409/06*

U.S. Cl. 424—273 R **19 Claims**

17. A method for effecting contraception in a male or female mammal by rendering spermatozoa ineffective, which method comprises administering to a subject an effective amount of at least one compound of the formula



(I)

wherein

R is alkyl of 1 to 12 carbon atoms, cyclopentyl, cyclohexyl, cyclopentylloweralkyl or cyclohexylloweralkyl;

Z is ethylene or propylene, optionally substituted with a single substituent which is lower alkyl;

A is the integer 1, 2, or 3;

or a pharmaceutically acceptable acid addition salt thereof.

4,489,088

N,N-DIMETHYL O-(1-CARBAMOYL-PYRAZOL-5-YL) CARBAMATES AS PEST-COMBATING AGENTS

Fritz Maurer, Wuppertal; Ingeborg Hammann, Muelheim, and Bernhard Homeyer, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

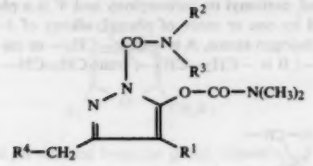
Filed Jan. 14, 1983, Ser. No. 458,126

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1982, 3202625

Int. Cl.[3] **A01N** *43/56;* **C07D** *231/20*

U.S. Cl. 424—273 P **11 Claims**

1. An N,N-dimethyl O-(1-carbamoyl-pyrazol-5-yl) carbamate of the formula



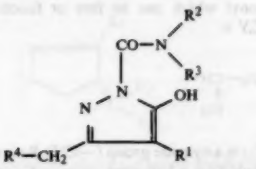
in which

R^1, R^2 and R^3 each independently is a hydrogen atom or an alkyl group having 1 to 6 carbon atoms, and

R^4 is an alkoxy, alkylthio, alkylsulphinyl or alkylsulphonyl group which has 1 to 6 carbon atoms.

9. A method of combatting insects or acarids, comprising applying to the insects or acarids, or to a habitat thereof, an insecticidally or acaridicidally effective amount of a compound according to claim **1**.

11. A 5-hydroxy-pyrazole of the formula



in which

R^1, R^2 and R^3 each independently is a hydrogen atom or an alkyl group having 1 to 6 carbon atoms, and

R^4 is an alkoxy, alkylthio, alkylsulphinyl or alkylsulphonyl group which has 1 to 6 carbon atoms.

4,489,089

SUBSTITUTED N-[ω-(1H-IMIDAZOL-1-YL)ALKYL]-AMIDES

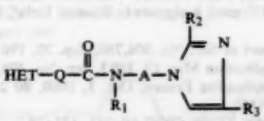
William B. Wright, Jr., Woodcliff Lake, N.J., and Jeffrey B. Press, Tuxedo, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 482,388, Apr. 6, 1983, abandoned. This application Jan. 13, 1984, Ser. No. 570,159

Int. Cl.[3] **A01N** *43/50*; **C07D** *233/64*

U.S. Cl. 424—273.R **13 Claims**

1. A compound selected from the group consisting of those of the formula:



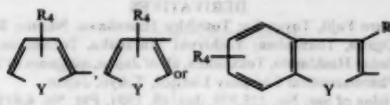
wherein A is a divalent moiety of the formulae:

$$-C_nH_{2n}- \text{ or } -CH_2CH{=}CHCH_2-$$

wherein n is an integer from 2 to 8, inclusive; R_1 is hydrogen, alkyl (C_1–C_3) or benzyl; R_2 and R_3 are each hydrogen, alkyl(C_1–C_3) or phenyl, Q is a divalent moiety of the formulae:

$$-C_mH_{2m}-,\ -CH{=}CH- \text{ or } -\overset{O}{\overset{\|}{C}}-$$

wherein m is zero, 1, 2 or 3; and HET is a heterocyclic moiety of the formulae:



wherein Y is oxo or thio; R_4 is hydrogen, halogen, dihalogen, lower alkyl or nitro; and R_5 is hydrogen or halogen; and the pharmacologically acceptable acid-addition salts thereof.

12. The method of inhibiting thromboxane synthetase enzyme in a mammal which comprises administering internally to said mammal an effective thromboxane synthetase enzyme inhibiting amount of a compound of claim **1**.

4,489,090

DIBENZOCYCLOALKANAMIDO AND DIBENZOTHIOXANTHENYL BENZOIC ACIDS

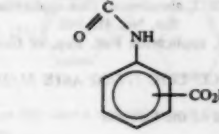
Vern G. DeVries, Ridgewood, N.J., and Robert G. Shepherd, Selbyville, Del., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 6, 1983, Ser. No. 492,097

Int. Cl.[3] **A61K** *31/22, 31/38*; **C07C** *103/733*; **C07D** *335/12*

U.S. Cl. 424—275 **9 Claims**

1. A compound of the formula:



wherein A is selected from the group consisting of $—CH_2CH_2—$, —CH=CH—, and —S—; B is selected from the group consisting of $>CHCH_2—$ and $>C{=}CH—$; R is selected from the group consisting of hydrogen and C_1–C_4 alkyl; and the pharmaceutically-acceptable salts thereof.

7. A method of reducing the cholesterol ester content of the arterial walls of a mammal in need of such treatment which comprises administering to said mammal an effective amount of a compound as recited in claim **1**.

8. A method of inhibiting artherosclerotic lesion development in a mammal in need of such treatment which comprises administering to said mammal an effective amount of a compound as recited in claim **1**.

4,489,091

ANTILIPEMIC AND ANTI-INFLAMMATORY COMPOSITIONS CONTAINING SULFONATE DERIVATIVES

Setsuro Fujii, Toyonaka; Toshihiro Hamakawa, Naruto; Kazuo Ogawa, Tokushima; Yoshiyuki Muranaka, Tokushima, and Sadao Hashimoto, Tokushima, all of Japan, assignors to Taiho Pharmaceutical Company Limited, Tokyo, Japan

Division of Ser. No. 225,979, Jan. 19, 1981, Pat. No. 4,411,911. This application May 9, 1983, Ser. No. 492,873

Claims priority, application Japan, Jan. 31, 1980, 55-11214; Jul. 11, 1980, 55-95299; Sep. 30, 1980, 55-137026; Dec. 19, 1980, 55-180852

The portion of the term of this patent subsequent to Oct. 25, 2000, has been disclaimed.

Int. Cl.[3] A61K *31/35, 31/34, 31/255*

U.S. Cl. 424—278 4 Claims

1. An antilipemic composition in the form of a tablet, capsule, granule, powder or liquid for oral administration, or suppository comprising an effective amount of a compound of the formula

$$R_1SO_3CH_2CO(CH_2)_nR_2$$

wherein R_1 is alkoxyalkyl having 2 to 6 carbon atoms, phenylalkyl, cycloalkyl or aryl (which is phenyl or naphthyl) with or without a substituent (which is alkyl having 1 to 12 carbon atoms, lower alkoxy, halogen, hydroxyl, carboxyl, acetamido, nitro or ethylenedioxymethyl), R_2 is alkyl having 1 to 15 carbon atoms, alkenyl having 2 to 15 carbon atoms, halogen, hydroxyl, lower alkoxy, lower alkoxycarbonyl, C_2 to C_6 acyloxy, benzyloxycarbonylamino, cycloalkyl having 3 to 6 carbon atoms, cyclic alkylether having 2 to 5 carbon atoms, cyclic alkenylether having 2 to 5 carbon atoms or phenyl or naphthyl with or without lower alkyl as substituent(s), and n is 0 or an integer of 1 to 6, when n is 0 R_2 is not alkyl having 1 to 15 carbon atoms, alkenyl having 2 to 15 carbon atoms, halogen, hydroxyl or lower alkoxy, when n is 0, 1 or 2, R_2 is not phenyl with or without lower alkyl as substituent(s), and a pharmaceutically acceptable carrier.

4,489,092

PROSTANOIC ACID DERIVATIVES AND THEIR PREPARATION

Helmut Vorbrüggen; Norbert Schwarz; Olaf Loge, and Walter Elger, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Bergkamen and Berlin, Fed. Rep. of Germany

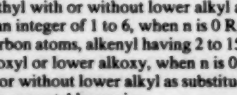
Division of Ser. No. 256,369, Apr. 22, 1981, Pat. No. 4,359,467, which is a division of Ser. No. 069,193, Aug. 24, 1970, Pat. No. 4,284,646, which is a continuation of Ser. No. 932,823, Aug. 10, 1978, abandoned, which is a continuation-in-part of Ser. No. 821,130, Aug. 2, 1977, abandoned. This application Sep. 1, 1982, Ser. No. 413,940

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1976, 2635985

Int. Cl.[3] C07C *177/00;* A61K *31/557*

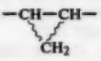
U.S. Cl. 424—304 38 Claims

1. A compound of the formula



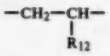
wherein R_1 is

wherein R_6 is hydroxy, a straight chain or branched alkoxy of 1-10 carbon atoms; aryloxy; O—CH_2—U—V wherein U is a direct bond, carbonyl or carbonyloxy and V is a phenyl ring substituted by one or more of phenyl, alkoxy of 1-2 carbon atoms, or halogen atoms, A is —CH_2—CH_2— or cis- or trans-CH=CH—; B is —CH_2—CH_2—, trans-CH=CH— or C≡C or



wherein the methylene group can be the α- or β-position; W is free or functionally modified hydroxymethylene, a free or functionally modified carbonyl, or

wherein R_{11} is alkyl of 1-5 carbon atoms and the OH- group can be in the α- or β-position and can be functionally modified; Z is carbonyl which can be free or functionally modified; X⋯⋯Y is



wherein R_{12} is a cyanide group (—CN); R_2 is a hydrogen atom or C_{1-5}-alkyl; R_3 is a hydrogen atom or C_{1-5}-alkyl; R_4 and R_5 each are methyl; and, when R_6 is hydroxy, the physiologically acceptable salts thereof with bases; wherein "functionally modified" OH refers to OH etherified by tetrahydropyranyl, tetrahydrofuranyl, α-ethoxyethyl, trimethylsilyl, dimethyl-tert-butylsilyl or tri-p-benzylsilyl or esterified by the acyl group of a C_{1-15} organic carboxylic or sulfonic acid; and "functionally modified" carbonyl refers to carbonyl converted to a cyclic ketal with ethylene glycol, 1,3-propanediol, 2,2-dimethyl-1,3-propanediol, 1,2-cyclopentanediol, or glycerol.

4,489,093

INSECTICIDAL ESTERS

Jacques Martel, Bondy; Jean Tessier, Vincennes, and André Tèche, Paris, all of France, assignors to Roussel Uclaf, Paris, France

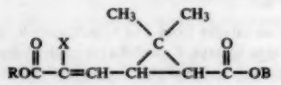
Continuation-in-part of Ser. No. 306,780, Sep. 29, 1981, abandoned. This application May 17, 1983, Ser. No. 495,481

Claims priority, application France, Oct. 1, 1980, 80 21017; Nov. 22, 1982, 82 19516

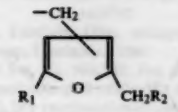
Int. Cl.[3] A01N *53/00;* C07C *69/743, 121/75*

U.S. Cl. 424—304 66 Claims

1. An ester in all possible isomeric form of the formula



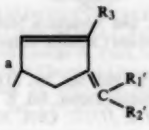
wherein R is selected from the group consisting of (a) alkoxyalkyl of 1 to 8 carbon atoms, alkyl of 1 to 8 carbon atoms optionally substituted with halogens and cycloalkyl of 3 to 8 carbon atoms, B is selected from the group consisting of


(1)

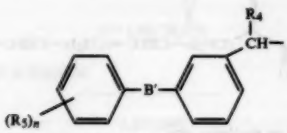
wherein R_1 is selected from the group consisting of hydrogen and methyl and R_2 is selected from the group consisting of $-CH_2-C\equiv CH$ and monocyclic aryl,

(2)

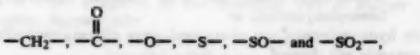
wherein a is selected from the group consisting of hydrogen and methyl and R_3 is an aliphatic group of 2 to 6 carbon atoms containing at least one carbon-carbon unsaturation,


(3)

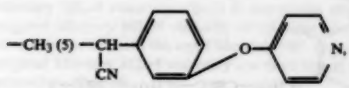
wherein a and R_3 have the above definition and R_1' and R_2' are individually selected from the group consisting of hydrogen, halogen, alkyl of 1 to 6 carbon atoms, aryl of 6 to 10 carbon atoms, cyano and alkoxy carbonyl of 2 to 5 carbon atoms

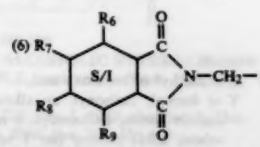

(4)

wherein B' is selected from the group consisting of

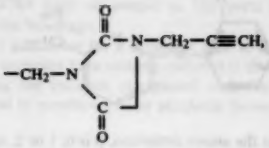


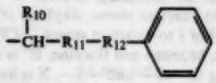
R_4 is selected from the group consisting of hydrogen, C≡N, $-CH_3$, $-CONH_2$, $-CSNH_2$ and $-C\equiv CH$, n is an integer from 0, 1 or 2 and R_5 is selected from the group consisting of halogen and





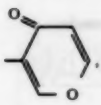
wherein R_6, R_7, R_8 and R_9 are selected from the group consisting of hydrogen, chlorine and methyl and S/1 symbolizes an aromatic ring or dihydro or tetrahydro ring

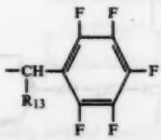

(7)


(8)

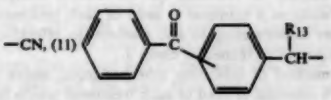
wherein R_{10} is selected from the group consisting of hydrogen, and —CN, R_{12} is selected from the group consisting of $-CH_2-$ and —O— and R_{11} is selected from the group consisting of thiazolyl and thiadiazolyl with the bond to

being in any one of the positions, R_{12} being bonded to R_{11} by the carbon atom included between a sulfur atom and a nitrogen atom,

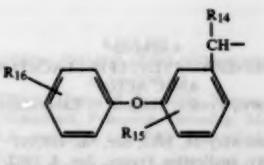

(9)


(10)

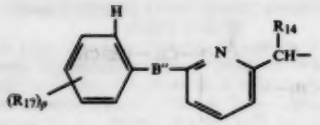
wherein R_{13} is selected from the group consisting of hydrogen and



wherein R_{13} has the above definition and the benzoyl is in the 3- or 4-position,


(12)

wherein R_{14} is selected from the group consisting of hydrogen, methyl, ethynyl and —CN and R_{15} and R_{16} are individually selected from the group consisting of hydrogen, bromine and fluorine and



(13)

wherein R_{14} has the above definition, p is 0, 1 or 2, each R_{17} is selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, alkylsulfonyl of 1 to 4 carbon atoms, $-CF_3$, 3,4-methylenedioxy, chlorine, bromine and fluorine, B'' is selected from the group consisting of —O— and —S—, X is halogen and the ethylenic double bond may have Z or E geometry.

50. A method of combatting insects comprising contacting pests with an insecticidally effective amount of at least one compound of claim **1**.

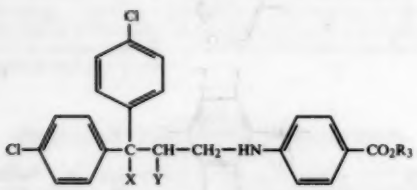
4,489,094

ARYLALKYLAMINOBENZOIC ACIDS

Robert G. Shepherd, Selbyville, Del., and Janis Upeslacis, Pomona, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 6, 1983, Ser. No. 492,095
Int. Cl.[3] **A61K** *31/245, 31/195;* **C07C** *101/60, 101/62*
U.S. Cl. 424—310 **11 Claims**

1. A compound of the formula:



wherein X and Y are each hydrogen or taken together represent a carbon-carbon bond and R_3 is selected from the group consisting of hydrogen, alkyl (C_1–C_4), alkali metal and alkaline earth metal.

8. A method of reducing the cholesterol content of the arterial walls of a mammal in need of such treatment which comprises administering to said mammal an effective amount of a compound as recited in claim **1**.

9. A method of inhibiting atherosclerotic lesion development in a mammal in need of such treatment which comprises administering to said mammal an effective amount of a compound as recited in claim **1**.

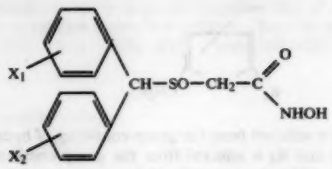
4,489,095

HALOGENOBENZHYDRYLSULFINYLACETOHYDROXAMIC ACIDS

Louis Lafon, Paris, France, assignor to Laboratoire L. Lafon, France

Filed May 26, 1983, Ser. No. 498,592
Claims priority, application France, Jun. 4, 1982, 82 09805
Int. Cl.[3] **C07C** *83/10;* **A61K** *31/185*
U.S. Cl. 424—315 **2 Claims**

1. A benzhydrylsulfinylacetohydroxamic acid derivative of the formula



(I)

wherein, X_1 and X_2 are F located in the para (4) position.

2. A therapeutic compound comprising a pharmaceutically effective amount of the compound according to claim **1** in association with a physiologically acceptable excipient.

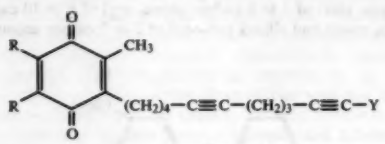
4,489,096

QUINONE COMPOUNDS, THEIR PRODUCTION AND USE

Shinji Terao, Toyonaka, and Yoshitaka Maki, Kyoto, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jul. 5, 1983, Ser. No. 511,083
Claims priority, application Japan, Jul. 9, 1982, 57-120194
Int. Cl.[3] **A61K** *31/2, 31/275;* **C07C** *50/00, 50/14*
U.S. Cl. 424—317 **9 Claims**

1. A compound of the formula:



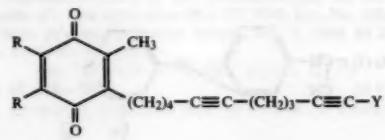
wherein

R is methyl or methoxy and

Y is formyl, carboxyl, an alkoxycarbonyl having 2 to 5 carbon atoms, carbamoyl, a mono- or dialkylcarbamoyl whose alkyl moiety has 1 to 4 carbon atoms, or carbamoyloxymethyl, or

its hydroquinone-form compound, or a pharmaceutically acceptable salt thereof.

9. A pharmaceutical composition suitable for suppressing the generation and release of SRS-A, which comprises as an active ingredient, an effective amount of a compound of the formula:



wherein

R is methyl or methoxy and

Y is formyl, carboxyl, an alkoxycarbonyl having 2 to 5 carbon atoms, carbamoyl, a mono- or dialkylcarbamoyl whose alkyl moiety has 1 to 4 carbon atoms, or carbamoyloxymethyl, or

its hydroquinone-form compound, or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier or excipient therefor.

4,489,097

INTRAVENOUS SOLUTIONS WITH ANTIMICROBIAL AGENT

Roger L. Stone, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 918,532, Jun. 23, 1978, abandoned, which is a continuation-in-part of Ser. No. 816,625, Jul. 18, 1977, abandoned, which is a continuation-in-part of Ser. No. 709,342, Jul. 28, 1976, abandoned. This application Jul. 8, 1982, Ser. No. 396,542

Int. Cl.³ A61K *31/20, 31/19, 37/00*

U.S. Cl. 424—318 2 Claims

1. In a process for the administration of a nutritive or saline solution or dispersion intravenously to a human or lower animal, the improvement which comprises admixing therewith at pH 3.5 to 6.0 a safe and effective amount of n-hexanoic acid, n-octanoic acid or a pharmaceutically-acceptable, water-soluble salt thereof, prior to or concurrently with said administration, whereby substantially all microorganisms known to be associated with infusion-related septicemia are killed within 1 minute of contact a decreased incidence of mycotic and bacterial infection is secured.

4,489,098

2,2,3-TRIHALOPROPIONALDEHYDES AS ANTIMICROBIAL AGENTS

Attila G. Relenyi, and George A. Paul, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 28, 1982, Ser. No. 425,359

Int. Cl.³ A01N *35/00*

U.S. Cl. 424—333 7 Claims

1. A method of treating an aqueous system to inhibit the growth of microorganisms therein which comprises adding to the aqueous system an effective amount of a 2,2,3-tribromopropionaldehyde which can be represented by the formula

$$X-CH_2CX_2\overset{O}{\overset{\|}{C}}H$$

wherein X is bromine.

4,489,099

VITAMIN E/DLTDP STABILIZER SYSTEM FOR CHEWING GUM SBR

Frank G. Shaheen, North Canton, and Jerry J. Dillon, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 28, 1983, Ser. No. 470,037

Int. Cl.³ A23G *3/30*

U.S. Cl. 426—3 15 Claims

1. An improved chewing gum rubber composition comprising: (1) styrene-butadiene rubber and (2) as a Mooney viscosity stabilizing system a combination of (a) 0.08 to 0.60 phr of dilauryl thiodipropionate and (b) 0.05 to 0.4 phr of Vitamin E wherein said chewing gum rubber composition has an aged Mooney ML-4 viscosity which is essentially the same as the original Mooney ML-4 viscosity of said chewing gum rubber composition wherein the aged Mooney ML-4 viscosity and the original Mooney ML-4 viscosity are determined using ASTM procedure D-1646.

4,489,100

METHOD OF FINING ALCOHOLIC BEVERAGES

Gheorghe Cioca, Belleville, N.J., assignor to Seton Company, Newark, N.J.

Continuation of Ser. No. 184,536, Sep. 5, 1980, abandoned. This application Oct. 14, 1982, Ser. No. 434,463

Int. Cl.³ C12C *9/08*; C12H *1/02*

U.S. Cl. 426—422 11 Claims

1. A method of clarifying alcoholic beverages comprising: admixing substantially pure particulate crosslinked insoluble native collagen with an alcoholic beverage subsequent to fermentation, said collagen being present at a level of at least 0.001 parts of weight to 100 parts by volume of alcoholic beverage;

aging the admixture for a sufficient time to allow the collagen to complex haze causing material in the beverage; and

separating the collagen complexed with the haze causing material to produce a clear alcoholic beverage.

4,489,101

PATTERN FORMING METHOD

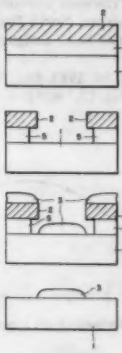
Hiroshi Shibata, Kanagawa, Japan, assignor to ULSI Technology Research Association, Japan

Continuation of Ser. No. 171,506, Jul. 23, 1980, abandoned. This application Sep. 24, 1982, Ser. No. 423,364

Claims priority, application Japan, Jul. 25, 1979, 54-96215

Int. Cl.³ H01L *21/308*

U.S. Cl. 427—39 15 Claims



1. A pattern forming method comprising the steps of:

forming a first film layer of a compound containing silicon and nitrogen directly on a substrate by plasma reaction;

forming a resist film layer in a desired pattern on said first film layer;

etching said first film layer at a rate of 1000–6000 Å/min with CF_4 gas at a pressure of approximately 1.0 Torr. with a power of 200 watts with said resist film layer as a mask;

forming a second film layer on said substrate having said first film layer thus etched and on the resist film layer; and

removing said first film layer from said substrate with an etchant which does not etch said second film layer.

4,489,102

RADIATION-STIMULATED DEPOSITION OF ALUMINUM

Leonard J. Olmer, Hopewell Township, Mercer County, and Daniel J. Shanefield, Princeton Township, Mercer County, both of N.J., assignors to AT&T Technologies, Inc., New York, N.Y.

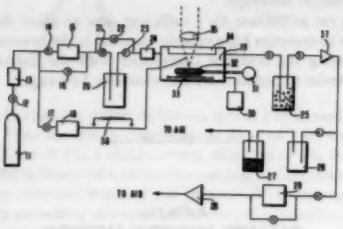
Filed Apr. 4, 1983, Ser. No. 482,078

Int. Cl.³ C23C *17/00*

U.S. Cl. 427—54.1 8 Claims

1. A method for depositing aluminum films on a non-cat-

alyzed substrate comprises exposing the substrate to vapors of a composition consisting of an aluminum hydride-trialkylamine



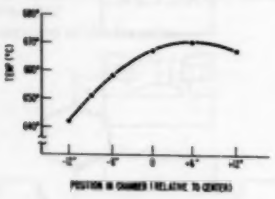
complex and exposing the surface to ultraviolet light in the areas where aluminum deposition is desired.

4,489,103

SIPOS DEPOSITION METHOD

Alvin M. Goodman, Princeton Township, Mercer County, and Herman F. Gossenberger, North Brunswick Township, Middlesex County, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Sep. 16, 1983, Ser. No. 532,973
Int. Cl.³ B05D 5/12
U.S. Cl. 427—85 **4 Claims**



1. In a method for vapor depositing semi-insulating polycrystalline silicon on a plurality of wafers disposed within a deposition chamber, wherein the wafers are serially arranged between a reactant gas inlet portion and an exhaust gas outlet portion, and wherein the reactant gas comprises a predetermined mixture of N_2O and SiH_4, the improvement comprising:

providing a positive, monotonically decreasing temperature gradient between the wafer closest to the inlet portion and the wafer closest to the outlet portion, such that the thickness and resistivity of the deposited semi-insulating polycrystalline silicon are substantially similar on each wafer.

4,489,104

POLYCRYSTALLINE SILICON RESISTOR HAVING LIMITED LATERAL DIFFUSION

Ming-Kwang Lee, Hsin chu, Taiwan, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Jun. 3, 1983, Ser. No. 500,613
Int. Cl.³ B05D 5/12
U.S. Cl. 427—101 **10 Claims**

1. A process for fabricating a polysilicon resistor having limited lateral diffusion in a polysilicon film supported on an insulated substrate which comprises:

(a) doping said film of polycrystalline silicon with an n-type dopant to a concentration of at least $1\times10^{18}/cm^3$;

(b) heat-treating the doped polycrystalline silicon film at a temperature of from about 600° to 1200° C., in an atmosphere of inert or oxidizing gases for a 3 to 60 min. period;

(c) selectively doping the resistor region of the heat-treated doped polycrystalline silicon film with a p-type dopant in a concentration less than or equal to the concentration of dopant in step (a) to form a resistor region;

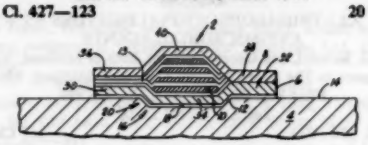
(d) activating the doubly doped heat-treated polycrystalline silicon film at a temperature of from about 900° to 1150° C. in an atmoshpere of inert or oxidizing gases for a 3 to 60 min. period.

4,489,105

METHOD OF MAKING A THIN FILM MAGNETIC HEAD

Fred S. Lee, Oklahoma City, Okla., assignor to Magnex Corporation, Oklahoma City, Okla.

Continuation of Ser. No. 152,851, May 23, 1980, abandoned.
This application Dec. 2, 1981, Ser. No. 326,913
Int. Cl.³ G11B 5/42; H01F 7/06
U.S. Cl. 427—123 **20 Claims**



1. A method of making a thin film magnetic head comprising the steps of:

selecting a substrate having a planar top surface;

defining the walls and bottom of a vacant offset region which in vertical cross-section is a trapezoid having its top side parallel to and longer than its bottom side and having one of its parallel sides in the plane of said top surface;

forming a first layer of magnetic film adjacent the bottom parallel side and extending parallel to and outward from the top parallel side of sai offset region to form first front and back gap portions;

forming within said offset region at least one layer of electrically conductive material parallel to the top surface and extending up to a plane above the top parallel side of said offset region; and

forming a second layer of magnetic film over said electrically conductive material and over said first layer of magnetic film to form second front and back gap portions with said first and second front gap portions being vertically spaced apart to form a front gap region.

4,489,106

TWO STEP INTERLEAVING METHOD

Paul F. Duffer, Creighton; Helmut Franz, Pittsburgh, and Joseph D. Kelly, Cheswick, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 29, 1982, Ser. No. 427,398
Int. Cl.³ B05D 1/36
U.S. Cl. 427—154 **8 Claims**

1. A method for protecting a glass surface which comprises the steps of:

a. contacting the glass surface with a solution of stain-inhibiting organic hydroxy acid;

b. evaporating the solvent to deposit a dried film of stain-inhibiting organic hydroxy acid on the glass surface; and

c. applying a particulate interleaving material to the acid-treated glass surface prior to contacting the glass surface in facing relationship with another glass surface.

4,489,107

PROCESS AND APPARATUS FOR PRODUCING AN OPTICAL COMPONENT, PARTICULARLY A METAL REFLECTOR

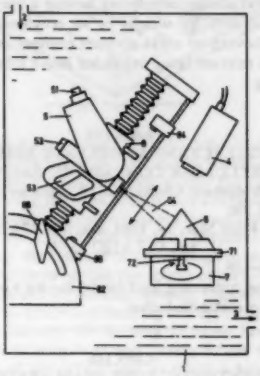
Helmut Pech, Rebstein, Switzerland, assignor to Wild Heerbrugg Aktiengesellschaft, Switzerland

Filed Jan. 5, 1983, Ser. No. 455,759

Claims priority, application Switzerland, Jan. 13, 1982, 183/82

Int. Cl.³ B05D 5/06

U.S. Cl. 427—162 8 Claims



1. A method for producing an optical component such as a metal reflector comprising the steps of

providing a glass prism supported on a rotatable mounting in an inert atmosphere;

providing a spray nozzle capable of dispensing a spray of a molten alloy having a low melting point along an axis;

supporting the spray nozzle such that the axis of the spray therefrom is perpendicular to exposed surfaces of the prism and so that the nozzle is linearly movable perpendicular to the spray axis;

spraying onto the surfaces of the prism a plurality of coatings of the metal alloy while maintaining the temperature of the atmosphere below the solidification temperature of the alloy;

concurrently rotating the prism and linearly reciprocating the nozzle during the spraying, the reversal points of the reciprocation being selected such that the spray is beyond the prism surfaces; and

removing the solidified coatings as a body having reflective surfaces.

4,489,108

PHOTOCHROMIC ASSEMBLY AND MANUFACTURE OF THIS ASSEMBLY

Stephen R. Postle, Brentwood, and Samuel B. Kingston, Doddinghurst, both of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Mar. 2, 1983, Ser. No. 471,554

Claims priority, application United Kingdom, Mar. 11, 1982, 8207067

Int. Cl.³ B32B 3/00, 15/00

U.S. Cl. 427—164 8 Claims

1. A process for the production of a photochromic assembly which comprises

(a) coating onto a self-supporting flexible plastic material a polymer latex which comprises from 10% to 40% by weight of the total solids of the latex photochromic glass beads from 0.05 μm to 50 μm in size the polymer latex having been prepared by emulsion polymerising

a monomer or monomer mixture which consists of a monomer which is an alkyl acrylate or an alkyl methacrylate or

a monomer mixture comprising both an alkyl acrylate and an alkyl methacrylate or

a monomer mixture comprising an alkyl acrylate and/or an alkyl methacrylate together with up to 5% by weight of an ethylenically unsaturated copolymerisable acid and/or up to 30% by weight of other ethylenically unsaturated comonomers

in the presence of at least 12% by weight of the monomers present of an anionic surfactant at a temperature of from 15° C. to 90° C. by use of a redox initiator system which is present to the extent of from 0.1 to 3% by weight of the monomers present,

and (b) drying the coated layer.

4,489,109

PROCESS FOR APPLYING LATEX RUBBER COATINGS TO ASBESTOS-CEMENT PRODUCTS

Victor Puskar, Basking Ridge, N.J., assignor to ASARCO Incorporated, New York, N.Y.

Filed Dec. 10, 1982, Ser. No. 448,482

Int. Cl.³ B05D 7/22

U.S. Cl. 427—230 12 Claims

1. A process for the production of a latex coated asbestos-cement product comprising:

forming the asbestos-cement product from an aqueous slurry of asbestos fibers, cement and silica on a means for forming a product of predetermined dimension;

removing the product from the means for forming a product;

coating the product with a latex composition comprising a styrene-butadiene copolymer to a predetermined thickness;

autoclaving the coated product for a predetermined time at a predetermined pressure and temperature in order to bond the latex composition to the cured asbestos-cement product;

cooling the product to a predetermined temperature.

2. A method as claimed in claim 1 wherein the asbestos-cement product is a pipe and the coating is applied to the interior surface thereof.

4,489,110

POLYETHYLENE TEREPHTHALATE MOULDING COMPOSITIONS HAVING HIGH REFLECTIVITY

Peter Bier, Krefeld, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 339,599, Jan. 15, 1982, abandoned. This application Jul. 21, 1983, Ser. No. 515,728

Int. Cl.³ C23C 11/00

U.S. Cl. 427—250 11 Claims

1. A process for preparing light reflectors comprising

(i) molding an article using a composition comprising

(I) from 30 to 85 parts by weight of polyethylene terephthalate having an intrinsic viscosity of at least 0.4 dl/g as measured by using a 0.5%, by weight solution in phenol/o-dichlorobenzene (weight ratio 60:40) at 25° C.:

(II) from 2 to 70 parts, by weight, of delaminated kaolin; and

(III) from 0 to 70 parts, by weight, of filiers other than delaminated kaolins and/or reinforcing agents and

(ii) metallizing at least a portion of said article.

4,489,111

BEADED TRIMMED SATIN CHRISTMAS ORNAMENT

Dorothy B. Woodrum, 3377 Ewa Beach Dr., Las Vegas, Nev. 89122

Filed Jan. 24, 1984, Ser. No. 573,395

Int. Cl.³ A47G 33/08

U.S. Cl. 428—11 1 Claim

1. A kit for making beaded, trimmed satin Christmas orna-

ments, comprising, in combination, a plurality of solid polystyrene balls covered with trimmed satin fibers of various lustrous colors, a wire loop attached to each said ball for hanging on a Christmas tree, and a plurality of separate components for being selectively mounted on each said ball; said separate components comprising a plurality of pins, a plurality of beads and a plurality of sequins of various shapes, sizes and colors; and at least some of said pins each having a spherical head, a

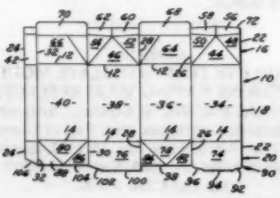
colored area on the top of said spherical head, and a hollow rotatable cap snap-fitted on said head, said cap being made of transparent plastic and having an opening at the bottom thereof for receiving said pin head, a circular row of areas around a side of said cap each being tinted in a different color for selective alignment with said colored area on said pin head top for producing a selective secondary color therewith, and an area on said cap which is opposite said opening being left untinted clear.

4,489,112

LAMINATED PAPERBOARD CONTAINER WITH ABSORPTION RESISTANCE MEANS, AND BLANK FOR CONSTRUCTING SAME

Daniel J. Wise, Farmington, and Donna M. Woodhall, Livonia, both of Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed Mar. 28, 1983, Ser. No. 479,603
Int. Cl.³ B65D *15/22*; B32B *21/06, 15/08*
U.S. Cl. 428—35 **19 Claims**



1. A one-piece foldable, laminated blank for forming a sealed liquid container, said blank comprising:

(a) a layer of fluorochemically treated kraft paperboard material having a predetermined weight per given area;

(b) a first layer of ionomer resin having a predetermined weight per given area and forming a uniform coating on one surface of said layer of kraft paperboard material;

(c) a layer of adhesive having a predetermined weight per given area and formed uniformly on the other surface of said layer of kraft paperboard material;

(d) a layer of a metalized material having a predetermined weight per given area and secured by said adhesive to said layer of kraft paperboard material;

(e) a second layer of ionomer resin having a predetermined weight per given area and forming a uniform coating on said layer of metallized material; and

(f) first and second layers of thermoplastic material having a predetermined weight per given area and forming uniform inner and outer coatings on said first and second layers of ionomer resin, respectively.

4,489,113

FLUORORUBBER-BASED HEAT-SHRINKABLE TUBES AND COMPOSITION THEREFOR

Keiji Ueno, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Feb. 5, 1982, Ser. No. 346,328
Claims priority, application Japan, Feb. 5, 1981, 56-16587; Feb. 5, 1981, 56-16588
Int. Cl.³ B32B *27/30*; C08L *27/16*
U.S. Cl. 428—36 **2 Claims**

1. A heat-shrinkable tube comprising a mixture of 100 parts by weight of fluororubber and 10 to 100 parts by weight of ethylene vinyl acetate copolymer having a vinyl acetate content of 10 to 30% by weight or an ethylene-ethyl acrylate copolymer having an ethyl acrylate content of 8 to 20% by weight, said mixture being expanded into a tubular form after cross-linking.

4,489,114

ARABINOGALACTANS AS RELEASE ADDITIVES FOR CELLULOSE CONTAINING CASINGS

Douglas J. Bridgeford, Champaign, Ill., assignor to Teepak, Inc., Oakbrook, Ill.

Filed Mar. 14, 1983, Ser. No. 474,760
Int. Cl.³ A22C *13/00*
U.S. Cl. 428—36 **27 Claims**

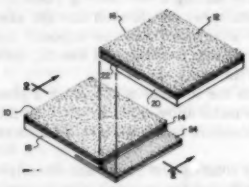
1. Cellulose containing food casing having a coating thereon containing an arabinogalactan.

4,489,115

SYNTHETIC TURF SEAM SYSTEM

Bruce W. Layman, Dallas, and Billy G. Privett, Fort Worth, both of Tex., assignors to SuperTurf, Inc., Garland, Tex.

Filed Feb. 16, 1983, Ser. No. 467,356
Int. Cl.³ B32B *3/06*
U.S. Cl. 428—62 **9 Claims**



1. A system for forming a flat temporary seam between two sections of cushion backed synthetic turf material comprising:

a first section of synthetic turf material having a first edge;

a first fabric web fastened to the underside of said first section of synthetic turf material along said first edge;

a first web of mated surface fastener material fastened to a portion of the underside of said first fabric web along said first edge;

a first cushion backing fastened to the underside of said first section of synthetic turf material and the remainder of the underside of said first fabric web;

a second cushion backing having a second edge and a shoulder formed along said second edge;

a second fabric web fastened to the top of said shoulder of said second cushion backing along said second edge;

a second web of mated surface fastener material fastened to a portion of said second fabric web along said second edge;

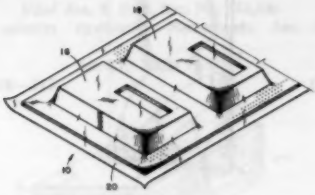
a web of cushion backing material fastened to the top of the remainder of said second fabric web; and

a second section of synthetic turf material fastened to the top of said second cushion backing and said web of cushion backing.

4,489,116
SKIN PACKAGING TECHNIQUE PROVIDING PAINT MASKING

James R. Flood, 25550 Merle St., Edwardsburgh, Mich. 49112

Filed Dec. 21, 1982, Ser. No. 451,949
Int. Cl.³ B32B 3/24; B65B 53/02
U.S. Cl. 428—138 9 Claims



1. A method for masking selected surfaces of a recessed nonplanar article by means of a permeable backing and a flexible plastic material used to shrink mount the article to the backing, comprising the steps of disposing a recessed portion in a surface of the article in registry with a through opening in the backing whereby edges of the recessed portion of the article follow generally the contour of the through backing opening which is proportioned so that the article edges are masked by the backing adjacent the backing opening, disposing the plastic material over the article and backing and applying heat, drawing a vacuum through the backing to cause heated flexible plastic material to wrap over and closely follow the contours of the surface of the article and to effect a bonding of the heated flexible plastic material to the backing and thereby mounting the article onto the backing, and coating the interior of the article whose exterior surfaces and the edges confronting the backing are effectively masked.

6. A shrink film package which selectively masks a recessed nonplanar article for coating of the interior of the article, comprising a permeable backing having a through backing opening therein, an article having a recessed portion in a surface and disposed in registry with the through backing opening, the backing opening following generally the contour of the recessed portion and edges of the recesse portion being masked by the backing adjacent the backing opening, a layer of pliant heat shrinkable film material overlying the article and associated surface of the backing, the film material conforming to the shape of the article and heat fusion bonded to the associated surface of the backing to secure the article to the backing, and a coating applied to the interior of the article, whereby the through backing opening provided access to the interior of the article for the coating of said interior with the edges of the article protectively masked therefrom.

4,489,117
SUPER HIGH DENSITY MAGNETIC RECORDING MEDIUM

Masaaki Ono, Omihachiman; Masahiko Motegi, Hikone, and Kazuo Okabe, Shiga, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Aug. 30, 1982, Ser. No. 413,125
Claims priority, application Japan, Sep. 1, 1981, 56-136139; Oct. 12, 1981, 56-160962
Int. Cl.³ H01F 10/04; G11B 5/64, 5/78
U.S. Cl. 428—147 39 Claims

1. A super high density magnetic recording medium, which comprises a coated polyester film and a ferromagnetic metal thin film formed on the coated surface of the coated polyester film, said coated polyester film comprising:

(A) a linear polyester film; and

(B) a discontinuous film formed on at least one surface of the linear polyester film, said discontinuous film having a net-like shape and/or a node-broken net-like shape and a thickness of not larger than 500 angstroms, and being applied to said linear polyester base film (A) over an area which is 10 to 90% of the area of said linear polyester base film (A), said discontinuous film (B) comprising:

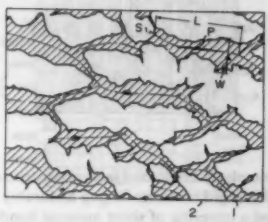
(i) a water-soluble polymer having a molecular weight of 10,000 to 2,000,000 and

(ii) a silane coupling reagent.

34. A super high density magnetic recording medium, which comprises a coated polyester film and a ferromagnetic metal thin film formed on the coated surface of the coated polyester film, said coated polyester film comprising:

(A) a linear polyester base film; and

(B) a discontinuous film formed on at least one surface of the base film, said discontinuous film having a net-like shape



and/or a node-broken net-like shape and a thickness of not larger than 500 angstroms, and being applied to said polyester base film (A) over an area which is 10 to 90% of the area of said polyester base film (A), said discontinuous film (B) comprising:

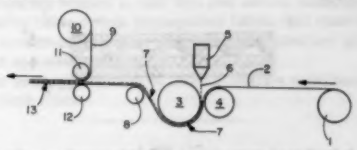
(i) a water-soluble polymer having a molecular weight of 10,000 to 2,000,000; and

(ii) a silane coupling reagent comprising an organic silicon monomer having in the molecular at least two different reactive groups, at least one of which is capable of linking with the water soluble polymer and at least one of which is capable of linking with the polyester.

4,489,118
SOFT MOISTURE RESISTANT TISSUE PRODUCT

Dan D. Endres, and Attila Matray, both of Outagamie County, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Mar. 3, 1983, Ser. No. 471,574
Int. Cl.³ B32B 27/10, 3/02
U.S. Cl. 428—154 12 Claims



1. A multi-layered tissue comprising:

(a) a first layer of creped cellulose wadding;

(b) a second layer of creped cellulose wadding; and

(c) a layer of plastic film disposed between said first and second layers;

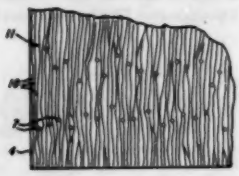
wherein said film is unbonded to said first layer, except where the film and first layer are bonded together along their common edges sufficiently to maintain the integrity of the tissue, and wherein said film is unbonded or lightly and uniformly bonded to said second layer, except where the film and the second layer are bonded together along their common edges sufficiently to maintain the integrity of the tissue, such that in all areas of the tissue other than said bonded edges the film can be peeled away from the first and second layer without rupturing either layer.

4,489,119

LAMINATED STRUCTURE

Yoshiki Ishige, Tokorozawa; Toshiyuki Kinugasa, Hidaka, and Shoji Sato, Tokorozawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 300,461, Sep. 8, 1981, abandoned. This application Aug. 11, 1983, Ser. No. 522,245
Claims priority, application Japan, Jul. 19, 1979, 54/90981
Int. Cl.³ B32B 3/28, 31/00
U.S. Cl. 428—167 4 Claims



1. In a complexly contoured laminated structure comprising a substantially rigid substrate having a plurality of holes therethrough and a covering of sheet material bonded to a face of the substrate, said sheet material having a thickness, the improvement comprising:

intersecting fine line grooves each having a width and a depth, said fine line grooves being

(a) formed in selected areas of the substrate,

(b) connected with said plurality of holes in said substrate,

(c) spaced apart from each other, and

(d) arranged in a random pattern and intersecting each other at regular intervals, the width of the fine line grooves being substantially less than the thickness of the sheet material.

4,489,120

ARCHIVAL CONTAINER CONSTRUCTION MATERIAL

William K. Hollinger, Jr., 7015 Duncraig Ct., McLean, Va. 22101

Filed Aug. 12, 1983, Ser. No. 522,795
Int. Cl.³ B32B 3/28, 29/00
U.S. Cl. 428—182 15 Claims

1. A boxboard comprising: a first layer of paperboard consisting of non-buffered, substantially pure alpha-cellulose and an alkaline size; a second layer of a paperboard comprising alpha-cellulose, an alkaline buffer and an alkaline size; and, intermediate said first and second layers, a layer of water-impermeable plastic.

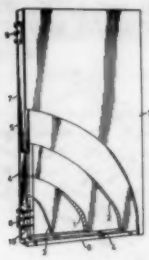
4,489,121

FIRE-RESISTANT SANDWICH CORE ASSEMBLY

John S. Luckanuck, Box 158, Cambridge, Ontario, Canada N1R 5S9

Filed Mar. 29, 1983, Ser. No. 480,120
Int. Cl.³ E04B 1/94
U.S. Cl. 428—192 19 Claims

1. A fire-resistant panel assembly comprising: a core of high density particle board having a pair of major faces; a protective sheet of rigid, high temperature fibre board made from bulk ceramic fibres having an alumina and silica base provided on



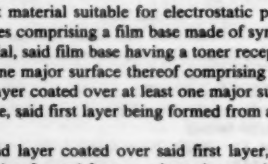
each of the major faces of the core; and a facing sheet provided on the outer surface of each of said protective sheets.

4,489,122

TRANSPARENCIES FOR ELECTROSTATIC PRINTING

Marvin R. Kammin, Minneapolis, and Terrance J. Russell, White Bear Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 13, 1982, Ser. No. 416,217
Int. Cl.³ B05D 1/36; B32B 27/08
U.S. Cl. 428—212 11 Claims



1. A sheet material suitable for electrostatic production of transparencies comprising a film base made of synthetic, polymeric material, said film base having a toner receptive coating on at least one major surface thereof comprising

a. a first layer coated over at least one major surface of said film base, said first layer being formed from an elastomer; and

b. a second layer coated over said first layer, said second layer being formed from a polymeric material containing surface rougheners consisting of particulate material, the particulate material having a refractive index closely matching that of the coating and being relatively non-abrasive to the coating, the coefficient of static friction measured between the polymeric material of said second layer and the nonimage side of the like sheet material being equal to or less than about 0.5, said film base, said first layer, and said second layer all being transparent to visible light.

4,489,123

LAMINATE OF METAL SHEET MATERIAL AND THREADS BONDED THERETO, AS WELL AS PROCESSES FOR THE MANUFACTURE THEREOF

Jacobus Schijve, Pijnacker; Laurens B. Vogelesang, Nieuwkoop, both of Netherlands, and Roelof Marissen, Cologne, Fed. Rep. of Germany, assignors to Technische Hogeschool Delft, Delft, Netherlands

Filed Jan. 8, 1982, Ser. No. 338,036

Claims priority, application Netherlands, Jan. 9, 1981, 8100088

Int. Cl.³ B32B *15/08*

U.S. Cl. 428—213 22 Claims

1. A fiber-reinforced, pre-stressed laminate adapted for use as a structural component of an air craft, comprising:

at least two sheets of an aluminum alloy, each of said sheets having a thickness in the range of 0.1 mm to less than 1 mm and a tensile strength of greater than 350 N/mm^2;

an adhesive layer located between each adjacent pair of said sheets, said adhesive layer comprising a thermohardening material disposed between the sheets to bond an adjacent pair of the sheets together;

aromatic polyamide fibers disposed in each said adhesive layer to reinforce the laminate, said fibers comprising poly-paraphenylene terephthalamide yarns made up of endless filaments formed from a material having a modulus of elasticity in the range of 5×10^4 to 25×10^4 N/mm^2 and an elongation at breakage of at least 2%, said yarns being disposed in substantially straight parallel lines in the adhesive layer and being present in an amount of 20 to 80% by weight based on the combined weight of the thermohardening material and the yarns,

said laminate in an unloaded state having in its entirety a compressive stress of up to 300 N/mm^2 in each of the sheets and a tensile stress in each said adhesive layer, the thickness of each of the sheets being greater than the thickness of each said adhesive layer containing said fibers.

4,489,124

PROCESS FOR FORMING THIN FILM, HEAT TREATMENT PROCESS OF THIN FILM SHEET, AND HEAT TREATMENT APPARATUS THEREFOR

Seizo Watanabe, 353-10, Kaminibukata-machi, Hachioji-shi, Tokyo, Japan

Filed Mar. 30, 1982, Ser. No. 363,441

Claims priority, application Japan, Apr. 6, 1981, 56-51547; Apr. 6, 1981, 56-51548; Apr. 6, 1981, 56-51549

Int. Cl.³ B05D *5/12*

U.S. Cl. 428—220 11 Claims

1. A process for forming a thin film layer containing a magnetic material comprising magnetic particles on a surface of a band-shaped base film having a given width and a given thickness, said band-shaped base film consisting essentially of a heat-shrinkable plastic, said process comprising:

(a) applying a given tension in the longitudinal direction to the band-shaped base film;

(b) depositing the thin film layer on the surface of said band-shaped base film under said given tension by means of vacuum deposition, sputtering, electron beam deposition or ion-plating to thereby form a thin film sheet;

(c) applying a fixed tension to said thin film sheet in the longitudinal direction of the band-shaped base film;

(d) heating said thin film sheet under said fixed tension at a temperature at which heat shrinkage of said thin film layer and said band-shaped base film of said thin film sheet occurs.

4,489,125

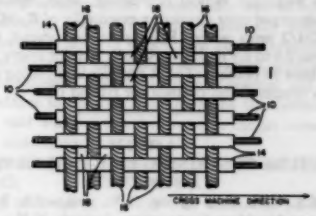
BATT-ON-MESH PRESS FELT HAVING INCREASED ABRASION RESISTANCE, BATT RETENTION AND DIMENSIONAL STABILITY

Yvon P. Gagnon, Wilson, N.C., assignor to Porritts & Spencer, Inc., Wilson, N.C.

Filed Dec. 16, 1983, Ser. No. 562,073

Int. Cl.³ B32B *5/02*

U.S. Cl. 428—235 15 Claims



8. A press felt comprising a mesh base and a fibrous batt disposed thereon, said mesh base comprising nylon yarn in the machine direction and nylon yarn encapsulated with ionomer resin in the cross-machine direction, the cross-machine direction ionomer resin-encapsulated nylon yarn including crimping.

4,489,126

THERMOFORMABLE LAMINATE STRUCTURE

James S. Holtrop, South Windsor, Conn., and Richard P. Maurer, Wilbraham, Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 21, 1983, Ser. No. 553,462

Int. Cl.³ B32B *5/18, 5/28*

U.S. Cl. 428—246 11 Claims

1. A moisture-resistant, moldable, thermoformable laminate structure comprising:

(a) a layer of a foamed thermoplastic material, said layer having first and second surfaces; and

(b) a coating bonded to said first and second surfaces; said coating being a resin impregnated fabric; said resin being an acrylic resin having a softening temperature greater than approximately 130° C.

5. The laminate structure of claim 1 wherein said fabric is a woven cloth fabric.

4,489,127

FLEXIBLE SILICONE RESIN COATED FABRIC

Beth I. Gutek, Freeland, Mich., and Bernard Van Wert, Norcross, Ga., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jul. 13, 1983, Ser. No. 513,503

Int. Cl.³ B32B *7/00*

U.S. Cl. 428—266 24 Claims

1. A silicone resin-coated fabric comprising an elastoplastic

organopolysiloxane resin coated silicone elastomer membrane reinforced with fabric, the elastoplastic organopolysiloxane resin and the silicone elastomer membrane forming an interface which is an adhesive bond derived from a combination comprising

(i) polydiorganosiloxane of the formula

$$X(R_2SiO)_nSiR_2X$$

where R is a monovalent hydrocarbon radical containing no more than 6 carbon atoms, X is a condensable endblocking group, and a has a value such that the polydiorganosiloxane has a viscosity of greater than 1 Pa.s at 25° C.,

(ii) a hydroxyl radical containing, solid, benzene soluble resin copolymer consisting essentially of $R_3SiO_{\frac{1}{2}}$ units and SiO4/2 units where R is as defined above, there being from 0.6 to 0.9 inclusive $R_3SiO_{\frac{1}{2}}$ unit for every $SiO_{4/2}$ unit, at least 95 percent of all R radicals in (ii) being methyl, and

(iii) a condensation catalyst for (i) and (ii).

4,489,128

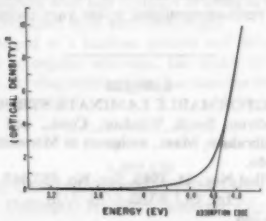
STRUCTURE CONTAINING EPITAXIAL CRYSTALS ON A SUBSTRATE

Richard F. Rutz, Cold Spring, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 280,145, Jun. 30, 1981, Pat. No. 4,382,837. This application Mar. 4, 1983, Ser. No. 472,392

Int. Cl.³ B32B *19/00*; H01L *21/205*

U.S. Cl. 428—332 **8 Claims**



1. Structure containing epitaxial crystals of $(SiC)_x(AlN)_{1-x}$ on a substrate wherein x is about 0.2 to about 0.5, and wherein said substrate is selected from the group of Al_2O_3 and AlN C-axis crystals.

4,489,129

POLYMER-COATED REINFORCEMENTS

Robert S. Shue, Bartlesville, and Faber B. Jones, Nowata, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 22, 1982, Ser. No. 401,031

Int. Cl.³ C08L *81/04*

U.S. Cl. 428—366 **57 Claims**

1. An article of manufacture comprising a reinforcement sized with poly(arylene sulfide); wherein said poly(arylene sulfide) is subsequently cured; and wherein the flow rate of said poly(arylene sulfide) is above about 150 grams/10 min. as measured in accordance with ASTM Test Method D1238, Procedure B modified to use a 5 kg weight and a temperature of 600° F.

7. A method comprising (i) sizing a reinforcement with poly(arylene sulfide) and (ii) curing said poly(arylene sulfide) on said reinforcement; wherein the flow rate of said poly(arylene sulfide) is above about 150 grams/10 min. as measured in accordance with ASTM Test Method D1238, Procedure B modified to use a 5 kg weight and a temperature of 600° F.

33. A composition comprising a reinforcement incorporated into a plastic wherein said reinforcement is sized with a poly(arylene sulfide) and said poly(arylene sulfide) is subsequently cured and wherein said plastic is a polymer characterized by the same type of polymeric repeating units which characterize said poly(arylene sulfide).

4,489,130

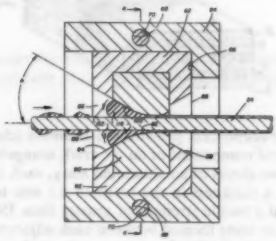
MAGNET WIRE

George D. Hilker, Fort Wayne, Ind., assignor to Phelps Dodge Magnet Wire Co., New York, N.Y.

Continuation-in-part of Ser. No. 255,473, Apr. 20, 1981, abandoned, which is a continuation-in-part of Ser. No. 931,314, Aug. 7, 1978, abandoned. This application Apr. 27, 1983, Ser. No. 489,191

Int. Cl.³ D02G *3/00*

U.S. Cl. 428—378 **4 Claims**



1. Magnet wires and other coated filaments comprising: an elongated filament and an essentially concentric and continuous and flexible coating superimposed on said filament, said coating being of a thermoplastic material with a melting point above about 170° C., said material being applied to said filament as a melt in a single pass, said coating adhering to said conductor and having a desired thickness, said thickness meeting the requirements of ANSI/NEMA Standards Publication No. MW1000-1977.

4,489,131

SIZE FOR GLASS FIBERS

Denny E. Black, and David W. Garrett, both of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 455,789, Jan. 6, 1983, Pat. No. 4,448,917. This application Jan. 19, 1984, Ser. No. 572,033

Int. Cl.³ B32B *17/04, 27/06*; C08K *5/09*

U.S. Cl. 428—391 **3 Claims**

1. A glass fiber sized with a size comprising a polyolefin latex, an amino silane, a polymeric film former and an organic acid selected from the group consisting of substituted benzoic acids, benzenedicarboxylic acids, benzenetricarboxylic acids, benzenetetracarboxylic acids, benzenepentacarboxylic acids, benzenehexacarboxylic acids, cyclohexanedicarboxylic acid, fatty acids, aliphatic diacids, aliphatic polyacids, cinnamic acids, benzenediacrylic acids, benzenediacetic acids, naphthoic acids, naphthalenedicarboxylic acids, naphthalenedisulfonic acids and anhydrides of the aforesaid acids said acid or acids being added in an amount sufficient to improve the impact strength of injected molded polypropylene into which glass fibers, coated with said size, are incorporated.

4,489,132

SPHERICAL BODIES OF CARBON OR GRAPHITE

Tatsuo Shimoyama, Hitachi, Japan, assignor to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Sep. 10, 1982, Ser. No. 416,611

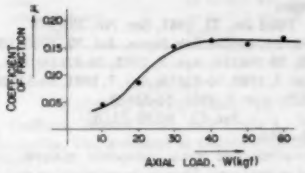
Claims priority, application Japan, Sep. 12, 1981, 56-14425

Int. Cl.³ B32B *9/00*; B29C *23/00*

U.S. Cl. 428—408 **9 Claims**

1. A spherical body formed of a carbon material having a

thermal conductivity at 25° C. of 0.03 cal/cm.sec.°C. to 1.0 cal/cm.sec.°C. and an anisotropy of thermal expansion coefficient of not more than 40% whereby the occurrence of pitting or cracking of the body due to thermal shock is prevented.



4,489,133

TWO-DIMENSIONAL CRYSTALLIZATION TECHNIQUE

Roger D. Kornberg, Atherton, Calif., assignor to The Board of Trustees of the Leland Stanford Jr. University, Stanford, Calif.

Filed Nov. 16, 1982, Ser. No. 442,066
Int. Cl.³ B32B *9/00*
U.S. Cl. 428—408 **10 Claims**

1. A method for ordering molecules in a lower free energy state as a monomolecular layer, wherein said molecules are characterized by being at least partially soluble in a polar medium, capable of forming an ordered array, capable of binding to a surfactant having lipophilic and hydrophilic regions, wherein said surfactant includes means for binding to said molecule in said hydrophilic region;

said method comprising:

combining under binding conditions a solution of said molecules in a polar solvent with a monolayer of said surfactant situated at about the surface of said solution, whereby said molecules bind to said surfactant; and

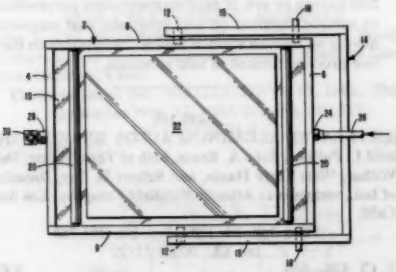
incubating the mixture for a time sufficient to allow for ordering of said molecules as a monomolecular layer.

4,489,134

PROCESS AND APPARATUS FOR FORMING A WINDOW PANEL HAVING AN ENERGY CONTROL FILM LAMINATE

Herbert Yudenfriend, 5065 Wynnefield Ave., Philadelphia, Pa. 19131

Filed Jul. 13, 1982, Ser. No. 397,771
Int. Cl.³ B32B *27/30, 27/28, 17/10*
U.S. Cl. 428—412 **17 Claims**



1. A method of preparing a substantially dust and scratch-free laminated window panel having an energy control film sheet attached to at least one surface of the window panel, said energy control film comprising an adhesive stratum adapted to contact and cause said film to adhere to said panel, comprising the steps of:

submerging said window panel in a filtered demineralized water bath;

submerging said energy control film sheet and passing it through said demineralized filtered water bath;

submerging a removable protective layer in said demineralized filtered water bath and superposing it upon said energy control film sheet; and,

pressing said energy control film sheet into intimate contact with said window panel, while submerged in the said bath, by squeegeeing across the exposed surface of said removable protective layer.

10. An acrylic window panel substantially free of inherent water and uncured monomers and substantially dust and scratch free having a layer of bubble free energy control film applied to the surface of said panel, said energy control film comprising an adhesive stratum adapted to contact and cause said film to adhere to the panel, produced by the method of:

preheating said window panel to remove excess water and uncured monomers;

submerging said window panel in a filtered demineralized water bath;

submerging said energy control film sheet and passing it through said demineralized filtered water bath;

submerging a removable protective layer in said demineralized filtered water bath and superposing it upon said energy control film sheet; and,

pressing said energy control sheet into intimate contact with said window panel, while submerged in the said bath, by squeegeeing across the exposed surface of said removable protective layer.

4,489,135

WATER-DILUTABLE COATING AGENT FOR PREPARING THE BASE LAYER OF A MULTILAYER COATING

Hermann-Josef Drexler, Guntersleben; Franz Ebner, Kist; Hans-Dieter Hille, Berg. Gladbach, and Ulrich Roth, Münster, all of Fed. Rep. of Germany, assignors to BASF Farben & Fasern AG, Hamburg, Fed. Rep. of Germany

Filed Feb. 18, 1983, Ser. No. 467,865
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1982, 3210051
Int. Cl.³ B05D *3/02*
U.S. Cl. 428—423.1 **15 Claims**

1. A process for preparing a multilayer coating, in which a substrate is coated with a base layer of a waterdilutable coating agent which contains pigments and a top coat of a transparent coating agent is applied thereto after an air drying period and the coated substrate is then heated, wherein the coating agent for the base layer contains as a binder an aqueous polyurethane dispersion which has been prepared by reacting

(A) a linear polyether diol and/or polyester diol having terminal hydroxyl groups and a molecular weight of 400 to 3,000 with

(B) a diisocyanate to form a first intermediate product in such a molar ratio that said first intermediate product has terminal isocyanate groups,

(C) and reacting said first intermediate product with a compound which has two groups which are reactive toward isocyanate groups and at least one group which is capable of forming an anion, said compound neutralized with a tertiary amine before the reaction and forming a second intermediate product, converting said second intermediate product, obtained from (A), (B) and (C), into a predominantly aqueous phase; and

(D) reacting isocyanate groups which are still present with a diamine and/or polyamine having primary and/or secondary amine groups.

4,489,136

HOMOGENEOUS LOW MELTING POINT COPPER BASED ALLOYS

Debasis Bose, Randolph; Amitava Datta, Morris Township, Morris County, and Nicholas J. DeCristofaro, Chatham, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 420,549, Sep. 20, 1982, Pat. No. 4,460,658. This application Apr. 26, 1983, Ser. No. 488,851
The portion of the term of this patent subsequent to Jul. 17, 2001, has been disclaimed.
Int. Cl.³ C22C 9/06; B22D 15/02
U.S. Cl. 428—606 13 Claims

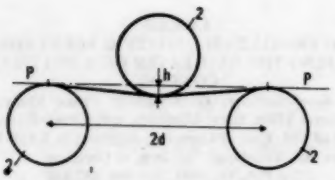
4. A homogenous brazing foil having a composition consisting essentially of 5 to 52 atom percent nickel, 2 to 10 atom percent tin and 10 to 15 atom percent phosphorus, the balance being copper and incidental impurities and the total of copper, nickel and tin ranging from about 85 to 90 atom percent.

4,489,137

PROCESS FOR INCREASING THE RESISTANCE TO CRACKING CORROSION OF ELONGATE ELEMENTS SUCH AS ARMORINGS OF FLEXIBLE PIPES OR CABLES AND THE RESULTANT PRODUCTS

Bernard Le Boucher, Versailles, and André Sugier, Rueil-Malmaison, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jul. 19, 1983, Ser. No. 515,244
Claims priority, application France, Jul. 19, 1982, 82 12697
Int. Cl.³ B21F 1/00
U.S. Cl. 428—610 20 Claims



16. A metal elongate element resistant to cracking corrosion, wherein the distribution of the internal stresses is such that, in a direction perpendicular to the surface of said element, or at least to the main surfaces corresponding to the larger size of the cross-section of said element, the metal comprises, in successive order, a zone of compressed state, a neutral zone and a zone under tension, said compression zone having been produced in said element by pretreatment by alternately flexing of the element in a manner such that the thickness of the compression zone produced is at least equal to one third of the distance between the surface and the axis of the element, and said flexing having been effected by passing the elongate element at least through a first train of rollers arranged in a staggered configuration such that in an arrangement of three rollers two of the rollers are located at a position lower than a center roller, and wherein the following conditions were met:

$$0.2 \leq \frac{h}{d} \leq 0.30$$

wherein h was the distance between the lowermost point of the center roller from the plane tangent to the lower two rollers at their uppermost point, and 2d is the distance separating the centers of the lower two rollers.

4,489,138

FIBER-REINFORCED METAL COMPOSITE MATERIAL

Kohji Yamatsuta, Osaka, and Ken-ichi Nishio, Shiga, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jul. 23, 1981, Ser. No. 285,975
Claims priority, application Japan, Jul. 30, 1980, 55-105729; Jul. 31, 1980, 55-106154; Apr. 7, 1981, 56-52616; Apr. 7, 1981, 56-52617; Apr. 7, 1981, 56-52618; Apr. 7, 1981, 56-52620; Apr. 7, 1981, 56-52621; Apr. 7, 1981, 56-52623
Int. Cl.³ B32B 15/20
U.S. Cl. 428—614 8 Claims

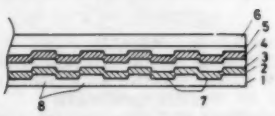
1. A fiber-reinforced metal composite material consisting essentially of an inorganic fiber as the reinforcing material, said inorganic fiber being a member selected from the group consisting of a carbon fiber, a silica fiber, a silicon carbide fiber, a boron fiber and an alumina fiber, and a metal or alloy as the matrix, wherein said metal or alloy is at least one member selected from the group consisting of aluminum, magnesium, copper, nickel and titanium, and alloys thereof, and wherein said metal or alloy comprises at least one element selected from the group consisting of elements belonging to the fourth or higher periods of the group (IA) in the periodic table, elements belonging to the fifth or higher periods of the group (IIA) in the periodic table and In, the element being used in an amount of from 0.0005 to 10% by weight (calculated in terms of the element).

4,489,139

MAGNETO-OPTIC MEMORY MEDIUM

Kenji Ohta, Yao, and Akira Takahashi, Nara, both of Japan, asxignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 337,132, Jan. 5, 1982, Pat. No. 4,390,600. This application Mar. 17, 1983, Ser. No. 476,345
Claims priority, application Japan, Jan. 14, 1981, 56-4090; Apr. 9, 1981, 56-54070; Apr. 10, 1981, 56-54711
The portion of the term of this patent subsequent to Jun. 28, 2000, has been disclaimed.
Int. Cl.³ B21D 39/00
U.S. Cl. 428—621 5 Claims



1. A magneto-optic memory medium consisting essentially of:

a substrate having strip-like grooves;

a magnetic film comprising a magneto-optic magnetization film having an axis of easy magnetization perpendicular to its surface disposed on said substrate, said magnetic film having an uneven surface which corresponds to the strip-like grooves formed in said substrate.

4,489,140

MULTI-LAYER ALUMINUM ALLOY BRAZING SHEET

Daniel L. Pulliam; John A. Evans, both of Terre Haute; David L. Wilbur, West Terre Haute, and Robert D. Fox, Rosedale, all of Ind., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 24, 1982, Ser. No. 391,768
Int. Cl.³ B32B 15/20
U.S. Cl. 428—654 5 Claims

1. A composite brazing material comprising a first layer composed of a 3000 series aluminum alloy, a second layer composed of a 4000 series aluminum alloy and, disposed therebetween and bonded respectively to said first and second layers, an intermediate layer composed of an aluminum alloy having the following composition:

silicon	6.8–8.2 wgt. %
iron	up to 0.8 wgt. %
copper	up to 0.25 wgt. %
manganese	up to 0.10 wgt. %
zinc	up to 0.20 wgt. %
other elements	up to 0.15 wgt. %
aluminum	balance

4,489,141
PASSIVE POTENTIOSTAT

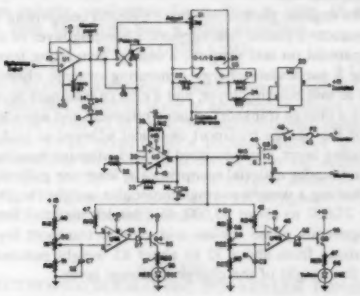
Gery R. Stafford, Summit, N.J., and Louie L. Scribner, Jr., Charlottesville, Va., assignors to Celanese Corporation, New York, N.Y.

Filed Aug. 23, 1982, Ser. No. 410,284
Int. Cl.³ H01M *6/50, 8/04, 10/48*; G01R *17/06*
U.S. Cl. 429—23 **2 Claims**

1. A passive potentiostat device which is adapted to function as a self-adjustable unipolar resistive load, in combination with a fuel cell, which device comprises:

an input electrometer circuit for measuring the potential between a reference electrode and the working electrode of the fuel cell;

a variable reference offset voltage source circuit for preselecting a specific potential for the working electrode, and for algebraically combining the electrometer output potential with the selected potential to produce a signal



which is the difference between the actual working electrode potential and the selected potential;

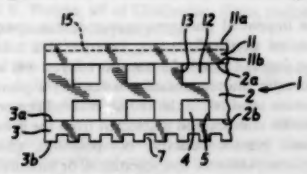
a voltage amplifier circuit for amplifying the said signal; and

a dynamic load circuit for receiving the amplified signal and regulating the impedance of the dynamic load to adjust the half-cell potential of the working electrode to the selected ptential level.

4,489,142
FUEL CELL COOLING ASSEMBLY

Chang V. Chi, Brookfield, and Bernard S. Baker, Brookfield Center, both of Conn., assignors to Energy Research Corporation, Danbury, Conn.

Continuation of Ser. No. 321,255, Nov. 13, 1981,. This application Nov. 17, 1983, Ser. No. 552,017
Int. Cl.³ H01M *8/24*
U.S. Cl. 429—26 **2 Claims**



1. A gas cooler assembly comprising:

a first plate having opposing first and second surfaces, said first surface having a plurality of grooves adapted to carry a cooling gas and said second surface having a plurality of grooves adapted to carry a cooling gas, said first plate being comprised of a carbonized material;

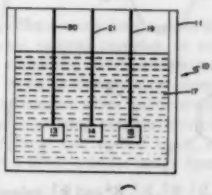
a second plate having opposing first and second surfaces, said first surface being flat and abutting said second surface of said first plate to define with said grooves of said second surface channels for carrying a cooling gas and said second surface of said second plate having a plurality of grooves of shallower depth than the grooves of the first and second surfaces of said first plate for carrying a process gas, said second plate being comprised of a carbonized material;

and a third plate having opposing first and second surfaces, said first surface being flat and abutting said first surface of said first plate to define with said grooves of said first surface of said first plate channels for carrying a cooling gas and said second surface of said third plate having a plurality of grooves of shallower depth than the grooves of the first and second surfaces of said first plate for carrying a process gas, said third plate being comprised of a carbonized material.

4,489,143
LITHIUM ALUMINUM/IRON SULFIDE BATTERY HAVING LITHIUM ALUMINUM AND SILICON AS NEGATIVE ELECTRODE

Marian Gilbert, Flossmoor, and Thomas D. Kaun, New Lenox, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 20, 1984, Ser. No. 572,345
Int. Cl.³ H01M *4/36*
U.S. Cl. 429—103 **20 Claims**



1. A negative electrode comprising a formed particulate mixture of a lithium-aluminum alloy and silicon.

8. A method of making a negative electrode comprising mixing lithium-aluminum alloy particles and silicon particles and forming the mixture into an electrode.

16. A secondary electrochemical cell having a positive electrode and a negative electrode and an electrolyte, said positive electrode comprising an active material of a chalcogen or a transition metal chalcogen, said negative electrode comprising a formed particulate mixture of a lithium-aluminum alloy and silicon, and said electrolyte containing lithium ions providing ionic communication between said positive and negative electrodes.

4,489,144
ISOXAZOLE DERIVATIVE ADDITIVE IN ORGANIC ELECTROLYTES OF NONAQUEOUS CELLS EMPLOYING SOLID CATHODES

Milton B. Clark, Olmsted Township, Cuyahoga County, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 28, 1983, Ser. No. 479,744
Int. Cl.³ H01M *6/16*
U.S. Cl. 429—196 **12 Claims**

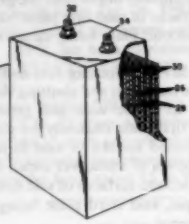
1. A nonaqueous cell comprising an anode; an organic electrolyte solution comprising a solute dissolved in a organic solvent; and a solid cathode, said cathode comprising a major amount of a solid active cathode material and a minor amount of graphite and/or carbon; and said organic electrolyte solution containing an isoxazole derivative in a range between greater than 0.2 and about 2.0 volume percent based on the volume of the organic solvent.

4,489,145

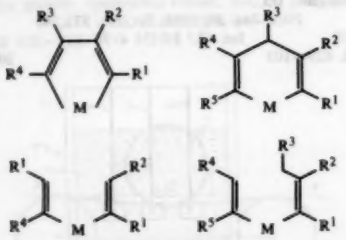
LITHIUM BATTERY

Kuzhikalail M. Abraham, 15 Hill St., Needham Heights, Mass. 02194; S. Barry Brummer, 62-2 Jacqueline Rd., and Joseph S. Foos, 17 Wilmot Rd., both of Waltham, Mass. 02154

Filed Oct. 18, 1983, Ser. No. 542,981
Int. Cl.³ H01M 10/40
U.S. Cl. 429—197 13 Claims



1. A rechargeable cell comprising a lithium-containing anode, a cathode, and an electrolyte, said electrolyte comprising a solvent, a lithium salt, and an additive in an amount sufficient to improve the cycle-life of said cell, said additive comprising a 5- or 6-member cyclic or acyclic organic compound of the general formulas



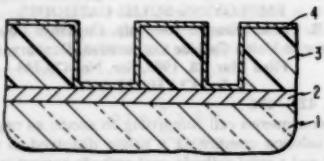
where each R^1, R^2, R^3, R^4 and R^5, independently, is hydrogen or lower alkyl and M is oxygen, sulfur, selenium, tellurium, or hydrogenated or lower alkyl-substituted X, where X is nitrogen, phosphorous, arsenic, antimony, or carbon.

4,489,146

REVERSE PROCESS FOR MAKING CHROMIUM MASKS USING SILICON DIOXIDE DRY ETCH MASK

Günther Bock, Boeblingen; Bernhard Hafner, Unterjettingen; Reinhold Mühl, Altdorf, and Klaus P. Thiel, Weiterstadt, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 17, 1983, Ser. No. 524,182
Claims priority, application European Pat. Off., Aug. 25, 1982, 82 107797.1
Int. Cl.³ G03F 1/00, 7/16, 7/26; B44C 1/22
U.S. Cl. 430—5 11 Claims



1. A reverse process for making a chromium mask comprising:

providing a substrate coated with a chromium layer;

applying a layer of positive resist onto the chromium layer;

exposing the said resist through an exposure mask, developing the resist and removing the unwanted portions thereof;

blanket coating by cathode sputtering a layer of a silicon dioxide material which is dry-etched more slowly than said chromium layer;

said conditions of said cathode sputtering is such that a layer of chromium oxide in the order of nanometers in thickness forms between said chromium layer and said silicon dioxide layer resulting in superior adherence between the said chromium and silicon dioxide layers;

lifting off said blanket-coating layer where it is upon said resist and leaving the said blanket-coating where it is upon said chromium layer; and

dry etching said chromium layer while using the remaining said blanket-coating layer as an etch mask to form said chromium mask.

4,489,147

ORGANIC PHOTOCONDUCTIVE ELEMENTS EMPLOYING A POLYCARBONATE RESIN

Mike S. H. Chang, Danbury, Conn.

Filed Dec. 16, 1981, Ser. No. 331,402
Int. Cl.³ G03G 5/06
U.S. Cl. 430—58 7 Claims

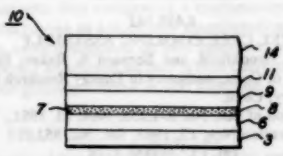
1. An organic photoconductive element comprising an electroconductive plastic film support, a bonding layer of an adhesive material on said support, a charge generating layer comprising a particulate charge generating organic chemical adhered to said bonding layer, and a charge transport layer comprising a charge transport organic chemical and a binder material for the charge transport chemical adhered to said charge generating layer, characterized by said adhesive bonding layer and said binder material comprising at least one polycarbonate resin having a weight average molecular weight ranging from about 25,000 to about 45,000, said binder material forming a homogeneous phase within said charge transport layer and comprising from about 35 to about 65 weight percent based upon the weight of the charge transport layer.

4,489,148

OVERCOATED PHOTORESPONSIVE DEVICE

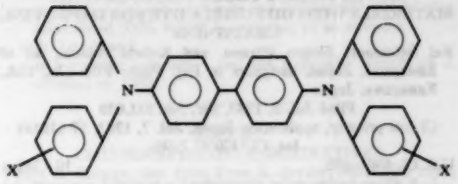
Anthony M. Horgan, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 25, 1983, Ser. No. 488,250
Int. Cl.³ G03G 5/06, 5/08, 5/14
U.S. Cl. 430—59 44 Claims



1. An improved photoresponsive device comprised in the order stated of the following layers: (1) a substrate (2) an adhesive layer, (3) a hole transport layer, (4) an inorganic, panchromatic photogenerating layer, (5) a photoconductive composition sensitive in the red or infrared region of the spectrum, which composition is selected from the group consisting of organic photoconductive compositions, charge transfer complex compositions, dye sensitizers, or mixtures thereof and (6) an polymeric overcoating layer.

27. An improved photoresponsive device in accordance with claim 1 wherein the hole transport layer comprises molecules of the formula:



dispersed in a highly insulating and transparent organic resinous material wherein X is selected from the group consisting of (ortho) CH_3, (meta) CH_3, (para) CH_3, (ortho) Cl, (meta) Cl, (para) Cl.

4,489,149

ELECTROPHOTOGRAPHIC AMORPHOUS SILICON MEMBER

Takao Kawamura, Sakai, and Masazumi Yoshida, Amagasaki, both of Japan, assignors to Minolta Camera Kabushiki Kaisha; Takao Kawamura, both of Osaka and Kyocera Corporation, Kyoto, all of, Japan

Continuation of Ser. No. 490,212, May 6, 1983, abandoned, which is a continuation of Ser. No. 254,189, Apr. 14, 1981, abandoned. This application Dec. 19, 1983, Ser. No. 562,733

Claims priority, application Japan, May 8, 1980, 55-62111; Oct. 13, 1980, 55-144189; Nov. 8, 1980, 55-157335

Int. Cl.³ G03G *5/082*

U.S. Cl. 430—65 **6 Claims**

1. An electrophotographic sensitive member which comprises a substrate, a barrier layer of amorphous silicon having a thickness of about 0.2 to 5 microns and containing about 0.05 to 1 atomic % of oxygen and a photoconductive layer of amorphous silicon formed on said barrier layer and containing about 10^{-5} to 5×10^{-2} atomic % of oxygen, about 10 to 40 atomic % of hydrogen and about 10 to 20000 ppm of a Group IIIa impurity of the Periodic Table.

4,489,150

ELECTROPHOTOGRAPHIC POLYESTER TONER BLENDS

Shaw-Ping Chang, San Jose, and Paul Shieh, Fremont, both of Calif., assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 8, 1983, Ser. No. 502,256

Int. Cl.³ G03G *9/08*

U.S. Cl. 430—106 **7 Claims**

1. A toner composition for electrophotographic developing, comprising a coloring agent and a thermoplastic polymeric blend comprising propoxylated bisphenol-A fumarate polyester and a polyester resin with a chemically bound halogen.

5. A toner according to claim 1 wherein said coloring agent is carbon black.

4,489,151

PHOTOSENSITIVE MATERIAL EMPLOYING ENCAPSULATED RADIATION SENSITIVE COMPOSITION

Frederick W. Sanders; Gary F. Hillenbrand; Jonathan S. Arney, and Richard F. Wright, all of Chillicothe, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Dec. 30, 1982, Ser. No. 454,396

The portion of the term of this patent subsequent to Aug. 16, 2000, has been disclaimed.

Int. Cl.³ G03C *1/40, 1/00*

U.S. Cl. 430—138 **29 Claims**

1. A photosensitive material comprising a support having on a surface thereof a plurality of capsules, said capsules containing, as the internal phase, a radiation sensitive composition which undergoes a change in viscosity upon exposure to actinic radiation, the sensitivity (log E) of said photosensitive material being less than 4.0 wherein upon exposing said material to actinic radiation and rupturing said capsules, said internal phase is image-wise released from said capsules and participates in forming a image.

4,489,152

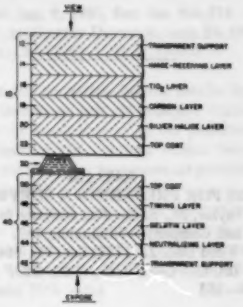
PHOTOGRAPHIC PRODUCT FOR SILVER TRANSFER IMAGES WITH POLYVINYLPYRROLIDONE IN CARBON BLACK LAYER

David F. Oberhauser, Somerville, and Peter H. Roth, Needham, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Feb. 29, 1984, Ser. No. 584,597

Int. Cl.³ G03C *1/84, 5/54*

U.S. Cl. 430—229 **9 Claims**



1. A photographic product comprising a sheet-like element comprising a transparent support carrying, in sequence, an image-receiving layer containing silver precipitating nuclei, a white light-reflecting layer, an opaque layer comprising carbon black, and a photosensitive silver halide emulsion layer, said opaque layer also containing polyvinylpyrrolidone in a concentration, by weight of said carbon black, effective to increase the density of a silver transfer image formed in said image-receiving layer.

4,489,153

PROCESS FOR PREPARING A POSITIVE OVERLAY

Robert W. Ashcraft, Towanda, and Jon G. Moehlmann, Sayre, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 22, 1983, Ser. No. 564,380

Int. Cl.³ G03C *1/68, 7/00; G03F 3/00*

U.S. Cl. 430—253 **7 Claims**

1. Process for preparing a positive overlay which comprises (a) exposing through a separation positive image a peel-apart photosensitive element comprising in order from top to bottom, (1) a strippable cover sheet comprised of a polymeric film which is transparent to actinic radiation, (2) a photoadherent layer containing a colorant and comprising a photohardenable material with ethylenically unsaturated or benzophenone type groups, (3) a nonphotosensitive organic contiguous layer, and (4) a sheet support, wherein, after exposure to actinic radiation, the peel force required to remove the cover sheet (1) with the exposed

photoadherent layer (2) thereon from the contiguous layer (3) is at least four times the peel force required to remove the cover sheet (1) from an unexposed photoadherent layer (2);

(b) peeling apart the exposed photosensitive element to form two elements: (i) cover sheet bearing on its surface colored exposed image areas, and (ii) sheet support bearing the contiguous layer having on its surface complementary colored unexposed image areas;

(c) adhering element (ii) to a transparent receptor;

(d) removing the transparent receptor and the colored unexposed image areas adhered thereto;

(e) repeating steps (a) to (d) at least one time; and

(f) overlaying the images in register.

4,489,154

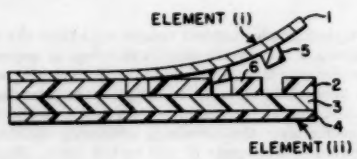
PROCESS FOR PREPARING A SURPRINT PROOF

Harvey W. Taylor, Jr., Sayre, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 22, 1983, Ser. No. 564,381

Int. Cl.³ G03C *1/68, 7/00;* G03F *3/00*

U.S. Cl. 430—253 **15 Claims**



1. A process for preparing a surprint proof which comprises

(a) exposing through an image bearing transparency a peel-apart photosensitive element comprising in order from top to bottom, (1) a strippable cover sheet comprised of a polymeric film which is transparent to actinic radiation, (2) a photoadherent layer containing a colorant and comprising a photohardenable material with ethylenically unsaturated or benzophenone type groups, (3) a nonphotosensitive organic contiguous layer, and (4) a sheet support, wherein, after exposure to actinic radiation, the peel force required to remove the cover sheet (1) with the exposed photoadherent layer (2) thereon from the contiguous layer (3) is at least four times the peel force required to remove the cover sheet (1) from an unexposed photoadherent layer (2);

(b) peeling apart the exposed photosensitive element to form two elements: (i) cover sheet bearing on its surface colored exposed image areas, and (ii) sheet support bearing the contiguous layer having on its surface complementary colored unexposed image areas;

(c) adhering one of said elements (i) or (ii) to the surface of a substrate, the degree of adhesion to the photoadherent layer being greater than the adhesion of the photoadherent layer to the contiguous layer or the cover sheet,

(d) separating either the cover sheet of element (i), or the sheet support and contiguous layer of element (ii);

(e) repeating steps (a) to (c) at least once using a new peel-apart photosensitive element which is adhered to said preceding element by a layer of adhesive.

4,489,155

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS WITH DIFFUSIBLE DYE FOR IMPROVING GRAININESS

Kei Sakanoue; Shigeo Hirano, and Keiichi Adachi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

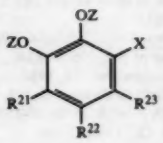
Filed Jul. 5, 1983, Ser. No. 511,030

Claims priority, application Japan, Jul. 7, 1982, 57-118161

Int. Cl.³ G03C *7/00*

U.S. Cl. 430—505 **10 Claims**

1. A silver halide color photographic material comprising a support having formed thereon a blue-sensitive silver halide emulsion layer, a green-sensitive silver halide emulsion layer, and a red-sensitive silver halide emulsion layer, at least one of said emulsion layers containing a non-diffusible coupler which forms a properly smearing diffusible dye upon reaction with the oxidation product of a color developing agent together with a substantially colorless competing compound which captures the oxidation product of a color developing agent wherein the colorless competing compound is represented by the general formula (CI)



(CI)

wherein X is a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkenyl group, a substituted or unsubstituted aryl group, or an —OZ group, wherein Z represents a hydrogen atom, an acyl group, and alkoxycarbonyl group, a carbamoyl group, a sulfonyl group, an alkyl group containing 1 to 20 carbon atoms, and an alkenyl group containing 2 to 22 carbon atoms or a methallyl group; R^{21}, R^{22} and R^{23} independently represent a hydrogen atom, a halogen atom, a cyano group, $—SO_2R^{24}$, $—COR^{24}$, a substituted or unsubstituted alkyl group containing 1 to 30 carbon atoms, a substituted or unsubstituted akenyl group containing 2 to 30 carbon atoms, a substituted or unsubstituted alkoxy group, a substituted or unsubstituted alkylthio group, a substituted or unsubstituted aryl group; and wherein R^{24} is a hydroxy group, a substituted or unsubstituted aryl group containing 1 to 30 carbon atoms, a substituted or unsubstituted alkoxy group, a substituted or unsubstituted aryloxy group, or a substituted or unsubstituted amino group.

4,489,156

CHLORAMPHENICOL DERIVATIVES

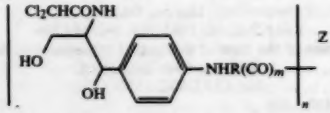
Pyare Khanna, San Jose; Evan S. Snyder, Mountain View, and Prithipal Singh, Sunnyvale, all of Calif., assignors to Syva Company, Palo Alto, Calif.

Filed Apr. 23, 1981, Ser. No. 256,761

Int. Cl.³ G01N *33/54;* C12Q *1/32;* C12N *9/96;* C07G *7/00*

U.S. Cl. 435—7 **8 Claims**

1. A compound of the formula:



wherein:

R is an aliphatic linking group of up to 12 atoms other than hydrogen having a chain of from 2 to 8 atoms consisting of carbon, nitrogen, and chalcogen of atomic no. 8 to 16;

Z is a poly(amino acid) consisting of polypeptides and proteins having 1 or more subunits and a molecular weight of at least about 5000, which is antigenic or an enzyme;
m is 0 or 1, and
n is a number between 1 and the molecular weight of Z divided by 1000.

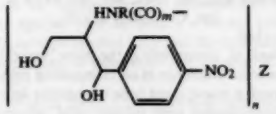
4,489,157

CHLORAMPHENICOL DERIVATIVES

Pyare L. Khanna, San Jose; Evan S. Snyder, Mountain View, and Prithipal Singh, Sunnyvale, all of Calif., assignors to Syva Company, Palo Alto, Calif.

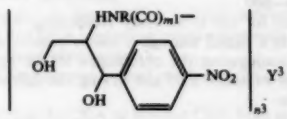
Filed Sep. 28, 1981, Ser. No. 306,569
Int. Cl.[3] **G01N** *33/54;* **C12Q** *1/32;* **C12N** *9/96;* **C07G** *7/00*
U.S. Cl. 435—7 **9 Claims**

1. A compound of the formula:



wherein:
R is an aliphatic linking group of up to 12 atoms other than hydrogen having a chain of from 2 to 8 atoms consisting of carbon, nitrogen, and chalcogen of atomic no. 8 to 16;
Z is a poly(amino acid), consisting of polypeptides and proteins having 1 or more subunits, of at least 5000 molecular weight;
m is 0 or 1; and
n is a number between 1 and the molecular weight of Z divided by 500.

9. A compound of the formula:



wherein:
m^1 is 0 or 1;
R is an aliphatic linking group of up to 12 atoms other than hydrogen having a chain of from 2 to 8 atoms consisting of carbon, nitrogen, and chalcogen of atomic no. 8 to 16;
Y^3 is an enzyme substituted at other than its active site its, having at least 30 percent of its activity prior to conjugation; and
n^3 is 1 to 30.

4,489,158

BINDING ASSAY FOR THE DETECTION OF MYCOBACTERIA

Eugene W. Straus, New York, N.Y., assignor to Montefiore Hospital and Medical Center, Inc., Bronx, N.Y.

Division of Ser. No. 146,294, May 5, 1980, Pat. No. 4,410,660.
This application Sep. 23, 1982, Ser. No. 421,956
Int. Cl.[3] **G01N** *33/54;* **C12Q** *1/04*
U.S. Cl. 435—7 **29 Claims**

1. A method for detecting the presence of Mycobacteria in a fluid or tissue which comprises:
mixing said fluid or tissue containing a secretory product of Mycobacteria with a complex of a tracer-containing molecule, and a binding macromolecule having reversible binding affinity for said tracer-containing molecule, and
detecting said tracer containing molecule wherein said tracer-containing molecule is a heat-stable charcoal-adsorbable labeled protein obtained from the growth media of *Mycobacterium tuberculosis,* said protein having a molecular weight of between 20,000 and 30,000, immunochemical stability over a temperature range of 4° C.–250° C., a pH range of 3.0–9.0 and exhibiting comigration towards the anode in the presence of bovine serum albumin and borate buffer at a pH of 8.6 with an applied voltage of 80 volts on starch gel electrophoresis for 12 hours.

4,489,159

PROCESS FOR PREPARING ESTERS OF HUMAN INSULIN

Jan Markussen, Herlev, Denmark, assignor to Novo Industri A/S, Denmark

Filed Aug. 9, 1982, Ser. No. 406,571
Claims priority, application Denmark, Aug. 10, 1981, 3537/81
Int. Cl.[3] **C12P** *21/04;* **C12N** *9/76*
U.S. Cl. 435—71 **12 Claims**

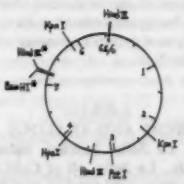
1. In a process for preparing human insulin by amidating human des-B30 insulin or salt or complex thereof with an L-threonine ester or a salt thereof in the presence of trypsin followed by subjecting the resulting human insulin Thr^{B30}-ester to one or more reactions to remove all protecting groups, the improvement which comprises:
amidating in a mixture of water and a water miscible solvent with a water content in such reaction mixture exceeding about 10% and being less than 30% v/v, at a reaction temperature below about 37° C. to human insulin Thr^{B30}-ester in at least 90% yield.

4,489,160

PLASMID PCG2

Ryoichi Katsumata, Machida; Tetsuo Oka, Yokohama, and Akira Furuya, Kawasaki, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Aug. 24, 1982, Ser. No. 410,887
Claims priority, application Japan, Aug. 26, 1981, 56/133557
Int. Cl.[3] **C12N** *1/20, 15/00, 1/00*
U.S. Cl. 435—253 **6 Claims**



1. An isolated plasmid pCG2 characterized by a molecular weight of about 6.6 kilobases and the following cleavage sites for restriction endonucleases:

Restriction enzyme	Number of cleavage sites
HindIII	3
KpnI	2
BamHI	1
PstI	1
HpaI	1
EcoRI	0
SalI	0
BglII	0

4,489,161

STRAIN OF *TRICHODERMA VIRIDE* TO CONTROL FUSARIUM WILT

George C. Papavizas, Beltsville, Md., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Oct. 25, 1982, Ser. No. 436,497

Int. Cl.[3] **C12N** *1/14;* **C12R** *1/885, 1/77;* **A61K** *37/00*

U.S. Cl. 435—254 **2 Claims**

1. A biologically pure culture of the fungus *Trichoderma viride* designated as T-1-R9.

4,489,162

FRESH BLOOD (UNFIXED) HEMATOLOGY CONTROL

Pamela L. Hawkins, and Carole J. Young, both of Miami, Fla., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Dec. 21, 1981, Ser. No. 332,781

Int. Cl.[3] **G01N** *33/48, 33/96;* **C09K** *3/00*

U.S. Cl. 436—10 **9 Claims**

1. A fluid comprising an essentially plasma and nutrient free hematologic control and calibration standard having a predetermined amount of washed and unfixed red blood cells in a low sodium buffered medium, a pH range of about 6.8 to about 8 and a stabilizer consisting essentially of about 5 to about 50 grams of a disaccharide per liter of buffered medium, the concentration of disaccharide and sodium ions relative to other unspecified components of the fluid being adjusted so as to (i) maintain the osmolality of the fluid in the range of from about 240 to about 310 mos/kg and (ii) preserve the native ionic concentration within the red blood cells, whereby an osmotic equilibrium across the red blood cell membrane is achieved thereby minimizing ionic transport across the red blood cell membrane.

9. A fluid comprising a plasma and nutrient-free hematologic control and calibration standard having a predetermined amount of washed and unfixed red blood cells in a low sodium buffered medium, a pH range of about 6.8 to about 8.0 and a stabilizer consisting essentially of about 5 about 50 grams of a disaccharide per liter of buffered medium, the concentration of disaccharide and sodium ions relative to other unspecified components of this fluid being adjusted so as to (i) maintain the osmolality of the fluid in a range of from about 240 to about 340 mos/kg and (ii) to preserve the native ionic concentration within the red blood cells, thereby an osmotic equilibrium across the red blood cell membrane is achieved whereby minimizing an ionic transport across the red blood cell membrane, the pH of the fluid being maintained with the above range by a buffer selected from a group consisting of potassium phosphate and Good's buffers.

4,489,163

RCRF AND ANALOGS

Jean E. F. Rivier, La Jolla; Joachim Spiess, Encinitas, and Wylie W. Vale, Jr., La Jolla, all of Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Filed Apr. 14, 1983, Ser. No. 484,931

Int. Cl.[3] **G01N** *1/00;* **A61K** *37/00;* **C07C** *103/52*

U.S. Cl. 436—86 **20 Claims**

1. A composition for lowering the blood pressure of animals comprising an effective amount of rCRF or an analog of CRF or a nontoxic addition salt thereof having a purity of at least about 5% and having the formula:

Y-R_1-Pro-Pro-Ile-Ser-R_8-Asp-Leu-R_{11}-R_{12}-R_{13}-Leu-Leu-Arg-R_{17}-R_{18}-R_{19}-Glu-R_{21}-R_{22}-R_{23}-R_{24}-R_{25}-R_{26}-R_{27}-R_{28}-Gln-Gln-Ala-R_{32}-R_{33}-Asn-Arg-R_{36}-Leu-R_{38}-R_{39}-R_{40}-R_{41}-NH_2

wherein Y is an acyl group having 7 or less carbon atoms or hydrogen; R_1 is Ser-Gln-Glu or pGlu-Gly or Gln-Glu or Glu or D-Ser-Gln-Glu or Ser-Glu-Glu or D-Ser-Glu-Glu or Glu-Glu or D-pGlu-Gly or desR_1; R_8, R_{12}, R_{19}, R_{24} and R_{40} are selected from the group consisting of Leu, Ile, Ala, Gly, Val, Nle, Phe and Gln; R_{11} is Thr or Ser; R_{13} is His, Tyr or Glu; R_{17} is Glu or Lys; R_{18} is Val or Met; R_{21} is Met, Met(O), Ile, Ala, Leu, Gly, Nle, Val, Phe or Gln; R_{22} is Ala or Thr or Glu; R_{23} is Arg or Lys; R_{25} is Asp or Glu; R_{26} is Gln or Lys; R_{27} is Leu, Ile, Ala, Gly, Val, Nle, Phe, Asp, Asn, Gln or Glu; R_{28} is Ala or Lys; R_{32} is His, Tyr or Ala; R_{33} is Ser, Asn, Leu, Thr or Ala; R_{36} is Lys or Leu; R_{38} is Met or Leu; R_{39} is Glu or Asp; R_{41} is Ala, Ile, Gly, Val, Leu, Nle, Phe, Gln or des R_{41}, provided however that when R_{38} is Leu, then R_{22} is Ala; and a pharmaceutically or veterinarily acceptable liquid or solid carrier therefor.

4,489,164

COLORIMETRIC METHOD FOR DETECTING ALDEHYDES IN AIR

Paul W. McConnaughey, and Elmer S. McKee, both of Pittsburgh, Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Aug. 30, 1982, Ser. No. 412,672

Int. Cl.[3] **G01N** *21/78*

U.S. Cl. 436—130 **3 Claims**

1. A method of determining the time weighted average concentration of an aldehyde in air comprising passing air to be sampled through a transparent tube containing an elongate bed of silica gel impregnated with sulfuric acid, whereby moisture and aldehyde are adsorbed on sequential lengthwise portions of the bed, and then contacting the bed with an aromatic hydrocarbon vapor reactive with the adsorbed aldehyde to form a colored reaction product, whereby a lengthwise portion of the bed will be colored.

4,489,165

CHROMOGENIC TRACERS FOR USE IN AN ASSAY

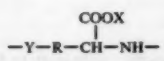
Daniel B. Wagner, and Richard L. Tyson, both of Raleigh, N.C., assignors to Becton Dickinson and Company, N.J.

Filed Jan. 24, 1983, Ser. No. 460,141

Int. Cl.[3] **G01N** *33/52, 33/54;* **B65D** *71/00*

U.S. Cl. 436—500 **42 Claims**

1. A tracer for use in an assay comprising: a chromogen conjugated to a ligand through a spacer radical, said spacer radical for conjugating the chromogen to the ligand being derived from an amino acid and having the following structural formula:



wherein X is selected from the group consisting of hydrogen, ammonium, amine salt and metal cations;

Y is selected from the group consisting of —NH— and

and R is selected from the group consisting of substituted and unsubstituted divalent hydrocarbon radicals having no more than 13 carbon atoms and wherein —R— and —CH— may be linked to form a carbocyclic radical.

4,489,166

MONITORING OF HUMAN ENDOMETRIAL FUNCTION BY RADIOIMMUNOASSAY OF PEP

Sharad G. Joshi, Latham, N.Y., assignor to Research Corporation, New York, N.Y.

Filed May 27, 1982, Ser. No. 382,599

Int. Cl.[3] **G01N** *33/56*

U.S. Cl. 436—510 **37 Claims**

1. A radioimmunoassay method for the quantitative determination of PEP in a body fluid comprising:

(a) partially purifying PEP chromatographically;

(b) radioisotopically labelling said partially purified PEP and further purifying it chromatographically;
(c) preparing an antibody specific against PEP using said partially purified PEP as an antigen;
(d) admixing a sample of the body fluid suspected of containing PEP with radioisotope labeled PEP and said antibody against PEP;
(e) incubating said mixture for a time sufficient to allow unlabeled PEP and radioisotope labeled PEP to competitively bind on said antibody against PEP;
(f) separating from said mixture antibody against PEP to which is bound unlabeled PEP and radioisotope labeled PEP;
(g) measuring the radioactivity of the separated antibody against PEP to which is bound unlabeled PEP and radioisotope labeled PEP; measuring the radioactivity of the mixture from which the antibody against PEP to which is bound unlabeled PEP and radioisotope labeled PEP was separated; or measuring the radioactivity of both the antibody against PEP to which is bound unlabeled PEP and radioisotope labeled PEP and the mixture from which it was separated to determine the content of PEP in said body fluid.

6. The method of claim 1 wherein said radioisotope is ^{125}I.

4,489,167

METHODS AND COMPOSITIONS FOR CANCER DETECTION

Yukio Ochi, Kyoto; Takashi Hachiya, Osaka; Tadayoshi Miyazaki, and Yoshihiro Kajita, both of Kyoto, all of Japan, assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jun. 2, 1981, Ser. No. 269,217

Int. Cl.[3] **G01N** *33/54, 33/56, 33/58;* **A61K** *43/00*

U.S. Cl. 436—518 **24 Claims**

1. A method comprising
(a) contacting an impure CEA (carcinoembryonic-antigen) or labelled CEA containing composition with an antibody to AG (acid-glycoprotein),
(b) removing the unadsorbed residue of the composition and
(c) separating the CEA or labelled CEA from said antibody.

21. A composition comprising CEA or labelled CEA which is substantially free of proteins which are not bound by antibody to AG.

22. A composition consisting essentially of intact CEA or intact, labelled CEA which composition is substantially free of the P segment of CEA.

23. The composition of claims 21 or 22 wherein the CEA is labelled with an enzyme or a radioisotope.

4,489,168

COMPOSITION OF MATTER FOR USE IN MANUFACTURING NON-MAGNETIC PARTS OF A MAGNETIC HEAD AND METHOD OF MANUFACTURING THE COMPOSITION

Larry A. Wank, Cornwallville, and Joseph G. Braitling, Saugerties, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 335,915, Dec. 30, 1981, abandoned. This application Oct. 27, 1983, Ser. No. 546,071

Int. Cl.[3] **C04B** *35/46*

U.S. Cl. 501—134 **3 Claims**

1. A nonmagnetic material for use in a magnetic head which consists of a composition which, by weight, is between 10 and 30% calcium oxide and between 70 and 90% titanium dioxide and more than 0% and up to 2% zirconium dioxide.

4,489,169

CRACKING CATALYST

Brent J. Bertus, and Dwight L. McKay, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 130,678, Mar. 17, 1980, Pat. No. 4,321,129, which is a division of Ser. No. 941,896, Sep. 12, 1978, Pat. No. 4,255,287, which is a continuation-in-part of Ser. No. 845,184, Oct. 25, 1977, abandoned. This application Nov. 20, 1981, Ser. No. 323,591

Int. Cl.[3] **B01J** *29/16, 23/90*

U.S. Cl. 502—64 **34 Claims**

1. A process for passivating at least one contaminating metal from the group consisting of nickel, iron, copper, cobalt and vanadium on a cracking catalyst which comprises contacting said cracking catalyst with (A) at least one of elemental antimony and compounds of antimony and (B) at least one of elemental tin and compounds of tin, whereby there is added to said cracking catalyst a modifying amount of each of (A) and (B) with the weight ratio of antimony in (A) to the tin in (B) being such as to provide a passivation of said contaminating metals on said cracking catalyst greater than the sum of the passivation effects of each of (A) and (B) individually.

14. A process in accordance with claim 1 wherein said cracking catalyst is a used cracking catalyst having deposited thereon a detrimental amount of at least one metal of the group consisting of nickel, iron and vanadium.

15. A process in accordance with claim 1 wherein said cracking catalyst is an unused cracking catalyst.

4,489,170

OXIDATION CATALYST, ESPECIALLY FOR THE PREPARATION OF METHACRYLIC ACID BY GAS PHASE OXIDATION OF METHACROLEIN

Richard Krabetz, Kirchheim, and Matthias Schwarzmann, Limburgerhof, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 1, 1983, Ser. No. 470,942

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1982, 3208571

Int. Cl.[3] **B01J** *27/14;* **C07C** *51/16*

U.S. Cl. 502—211 **11 Claims**

1. An oxidation catalyst of the formula: $Mo_{12}W_{0.1-3}P_{0.1-4}Sb_{0.1-3}O_x$ wherein x is the number of oxygen atoms formally required to saturate the valences of the remaining constituents of the catalyst, prepared by a process comprising:
(a) combining molybdenum, phosphorous, antimony and tungsten compounds in the presence of ions of monocarboxylic acids of one or two carbon atoms, dicarboxylic acids or hydroxycarboxylic acids in an aqueous solution or suspension under conditions such that the amount of said organic acid ranges from 0.02 to 2 moles per mole of molybdenum and the chloride ion concentration in said solution or suspension is less than 0.3 mole per mole of molybdenum;
(b) removing water from the solution or suspension; and
(c) calcining the residue obtained.

4,489,171

TANTALUM (V) HALIDE/OXIDE-METAL OXIDE COMPOSITIONS AND A PROCESS FOR THEIR PREPARATION

Thomas H. Johnson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 29, 1983, Ser. No. 527,535

Int. Cl.[3] **B01J** *21/04, 23/20, 27/10, 27/12*

U.S. Cl. 502—231 **8 Claims**

1. A process for preparing a metal oxide substrate having a tantalum (V) halide(s)/oxide(s) bound to the surface thereof which process comprises subliming a tantalum pentahalide and reacting in a substantially anhydrous and oxygen-free atmosphere the vapor therefrom with a substantially anhydrous

metal oxide substrate having surface hydroxyl groups attached thereto.

6. A composition comprising pentavalent tantalum, halogen, oxygen and a metal oxide substrate wherein at least one valence of tantalum is bound to oxygen which is bound to the substrate, at least one valence at the tantalum is bound to halogen and the remaining tantalum valences are bound to halogen and/or oxygen which may or may not be bound to the substrate wherein said halogen is a mixture of chloride and fluoride and is prepared by a process which comprises:

a. reacting a substantially anhydrous, hydroxyl-containing metal oxide substrate with tantalum pentachloride in the vapor state,

b. contacting the product of step (a) with an oxygen-containing atmosphere and

c. contacting the product of step (b) with a liquid or gaseous fluorinated hydrocarbon.

4,489,172

ACTIVATED CHROMIUM CATALYST TREATED WITH TERTIARY ALCOHOL

Max P. McDaniel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 3, 1983, Ser. No. 500,752

Int. Cl.³ B01J *21/06, 21/36*

U.S. Cl. 502—239 **25 Claims**

1. A process for producing a catalyst comprising:

contacting an activated silica-titania supported chromium catalyst precursor with a tertiary alcohol; and

reactivating the resulting treated catalyst in an oxygen-containing ambient at a temperature within the range of 200° C. to 600° C.

23. A method according to claim 1 wherein said contacting is done by slurrying said silica-titania supported chromium catalyst precursor in an inert diluent containing said tertiary alcohol, said tertiary alcohol is present in an amount within the range of 1 molecule of alcohol per atom of chromium to 10 molecules of alcohol per atom of chromium, said contacting is carried out for a time of one minute to 4 hours; wherein said tertiary alcohol is selected from tertiary butanol, tertiary amyl alcohol, 2-methyl-2-pentanol, 3-ethyl-3-pentanol, 2,2,4-trimethyl-4-pentanol and mixtures thereof, wherein said reactivating is carried out at a temperature of 300° C. to 400° C. in air and said activated silica-titania supported chromium catalyst precursor is produced by calcination in air at a temperature of 600° C. to 800° C. and wherein titanium is present in the support of said silica-titania supported chromium catalyst precursor in an amount within the range of 0.5 to 5 weight percent based on the weight of said support.

24. A catalyst produced by the method of claim 23.

4,489,173

LARGE PORE SHAPED HYDROPROCESSING CATALYSTS

Kirk R. Gibson, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 291,588, Aug. 10, 1981, Pat. No. 4,391,740. This application Jun. 30, 1983, Ser. No. 510,105

The portion of the term of this patent subsequent to Jul. 5, 2000, has been disclaimed.

Int. Cl.³ B01J *35/02*

U.S. Cl. 502—313 **12 Claims**

1. A catalyst for hydroprocessing heavy hydrocarbonaceous feedstocks, which catalyst:

(a) comprises between 2 and 25 weight percent of a catalytic metal from Group VIB and between 0 and 15 weight percent of a catalytic metal from Group VIII supported on a catalyst base selected from the group consisting of refractory inorganic oxides, fibrous clays, and combinations thereof, where said weight percentages are based on the reduced catalytic metal content as a percentage of the total catalyst weight; and

(b) has the form of elongated extrudates which have:

(i) a cross-section which is an oval with at least one section extending from the flat surface of the oval and which has a first dimension between about 0.060 and about 0.125 inch and a second dimension, perpendicular to the first dimension, between about 0.030 and about 0.100 inch; and

(ii) a surface area to volume ratio of less than 95 reciprocal inches.

4,489,174

VESICULATED BEADS

Michael Karickhoff, Matteson, Ill., assignor to The Sherwin-Williams Company, Cleveland, Ohio

Division of Ser. No. 517,491, Jul. 26, 1983, Pat. No. 4,461,849. This application May 3, 1984, Ser. No. 606,483

Int. Cl.³ C08J *9/22*

U.S. Cl. 521—54 **6 Claims**

1. An aqueous coating composition which comprises:

(a) a water dispersible synthetic polymer; and

(b) an opacifying amount of vesiculated beads

wherein the vesiculated beads are prepared by a process which comprises:

(i) forming in the presence of a polyamine, as a water-in-oil emulsion, a stable dispersion of droplets of water in a solution of a carboxylic acid functional unsaturated polyester resin having an acid value of 8 to 20, and at least one ethylenically unsaturated monomer copolymerizable with the polyester; and

(ii) forming in an aqueous solution, as a water-in-oil-in-water emulsion, a stable dispersion of the globules of the droplet-containing amine neutralized solution of the carboxylic acid functional unsaturated polyester and copolymerizable monomer; and

(iii) polymerizing the polyester and copolymerizable monomer by free radical addition polymerization thereby producing granules of opaque, cross-linked vesiculated beads;

wherein the polyamine contains at least 3 amine groups per molecule; and wherein the amine is present at a concentration such that there are at least about 2.0 amine groups per each carboxylic acid group.

4,489,175

METHOD OF PRODUCING A UREA FORMALDEHYDE COMBINATION FOAM WITH A LOW CONTENT OF FORMALDEHYDE

Heinz Baumann, Kleinniedesheim, and Rembert Baumann, Mannheim, both of Fed. Rep. of Germany, assignors to Schaum-Chemie W. Bauer GmbH & Co KG, Fed. Rep. of Germany

Filed Apr. 28, 1983, Ser. No. 489,556

Claims priority, application Fed. Rep. of Germany, May 6, 1982, 3216897

Int. Cl.³ C08J *9/30*

U.S. Cl. 521—116 **6 Claims**

1. A method for producing a urea formaldehyde combination foam which is low in formaldehyde by foaming a solution of a urea formaldehyde resin precondensate with a hardener/-foaming agent solution, characterized by dissolving up to 960 g urea per liter of aqueous extract comprising approximately 10% to 30% alkyl, aryl or alkaryl sulphonic acid, mixing said solution with a conventional hardener/foaming agent solution containing the sodium salt of an alkyl, aryl or alkaryl sulphonic acid in an aqueous diluent, in a ratio of sulphonic acid solution to sodium sulphonate solution of 1:1 to 1:4, adjusting the pH value to from 0 to 3, and foaming said mixture together with a urea-formaldehyde resin precondensate solution in the conventional manner.

4,489,176

POLYURETHANE COMPOSITIONS USEFUL AS ADHESIVES FOR INSULATION MATERIALS AND/OR FACINGS

Hermann Kluth; Robert Bachmann, both of Duesseldorf, and Georg Böerner, Bad Hersfeld, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed May 8, 1984, Ser. No. 608,326

Claims priority, application Fed. Rep. of Germany, May 11, 1983, 3317193

Int. Cl.³ C08G *18/14*

U.S. Cl. 521—144 24 Claims

1. A polyurethane composition comprising:

(A) 55% to 80% of a polyurethane prepolymer containing terminal isocyanate groups which is the reaction product of

(a) at least one polyhydric alcohol having a hydroxyl number of about 50 to 250 and a number-average molecular weight of about 500 to 5,000; and

(b) at least one polyfunctional isocyanate which is aromatic, aliphatic, or cycloaliphatic, and which has a functionality of about 1.5 to 3.5, wherein the ratio of hydroxyl groups to isocyanate groups is in the range 1:3-11;

(B) 0.5% to 8% of at least one foam stabilizer which is a block copolymer of at least one polysiloxane block and at least one polyoxyalkylene block;

(C) 10% to 20% of at least one diluent which is an organic solvent having a boiling point of about 20° C. to 60° C.; and

(D) 0 to 20% of at least one auxiliary which is a flameproofing agent, plasticizer, or accelerator; all percentages being by weight based upon the total weight of the composition.

4,489,177

ISOCYANATE-REACTIVE COMPOUNDS FROM TDI DISTILLATION RESIDUE AND POLYURETHANES PREPARED THEREFROM

James M. O'Connor, Clinton; Wilhelm J. Schnabel, Branford; Michael L. Rosin, Madison, and Robert M. Early, North Branford, all of Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Dec. 29, 1983, Ser. No. 566,835

Int. Cl.³ C08G *18/14, 18/32, 18/72*

U.S. Cl. 521—164 20 Claims

1. A process for preparing an isocyanate-reactive compound, comprising reacting TDI distillation residue with a polyol in such proportions as to obtain a reaction product having an OH-number (mg KOH/g) of about 200 to about 700, said TDI distillation residue being obtained from the distillation of the product of phosgenating toluene diamine to the corresponding toluene diisocyanate and having a toluene diisocyanate content of about 30% to about 70% by weight.

9. A process for preparing a polyurethane foam from a reaction mixture which comprises reacting an organic polyisocyanate; a foaming agent; a reaction catalyst; and an isocyanate-reactive compound prepared by reacting TDI distillation residue with a polyol in such proportions as to obtain a reaction product having an OH-number (mg KOH/g) of about 200 to about 700, said TDI distillation residue being obtained from the distillation of the product of phosgenating toluene diamine to the corresponding toluene diisocyanate and having a toluene diisocyanate content of about 30% to about 70% by weight; and, optionally, an additional compound reactive with said organic polyisocyanate.

4,489,178

MANNICH CONDENSATES HAVING FIRE RETARDANCY PROPERTIES AND MANUFACTURE OF RIGID POLYURETHANE FOAM THEREWITH

Michael E. Brennan, and George P. Speranza, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 25, 1983, Ser. No. 545,422

Int. Cl.³ C08G *18/14, 18/32*

U.S. Cl. 521—167 15 Claims

1. An alkoxylation product of a Mannich condensate component and alkoxylation component, said alkoxylation product having dissolved therein, as the sole melamine component, a minor amount of melamine, said Mannich condensate having been prepared by reacting 1 to 3 mols of formaldehyde and 1 to 3 mols of diethanolamine with 1 mol of a phenolic component, said phenolic component comprising phenol or a phenol substituted with an alkyl group containing 1 to 12 carbon atoms; the alkoxylation component of the alkoxylation product comprising from 100 to about 90 wt. % of propylene oxide and from 0 to about 10 wt. % of ethylene oxide.

7. In a method of preparing a rigid polyurethane foam composition wherein an excess of an aromatic polyisocyanate is reacted with a polyol component in the presence of a catalyst, a blowing agent, a surfactant and a fire retardant;

the improvement for obtaining a rigid polyurethane foam having improved fire retardancy properties which comprises:

utilizing as the polyol component from 100 to about 40 wt. % of an alkoxylated Mannich condensate and, correspondingly, from 0 to about 60 wt. % of a polyoxyalkylene polyl component,

said alkoxylated Mannich condensate being a condensate of a phenolic component, formaldehyde and diethanolamine reacted in the mol ratio of about 1 to 3 mols of formaldehyde and about 1 to about 3 mols of diethanolamine per mol of said phenolic component and having been alkoxylated with an alkylene oxide component and having had dissolved therein less than about 1 wt. % of melamine as the sole melamine component,

said phenolic component comprising phenol or phenol substituted with an alkyl group containing 1 to 12 carbon atoms,

said aklyene oxide component comprising 100 to about 90 wt. % of propylene oxide and 0 to about 10 wt. % of ethylene oxide,

said polyoxyalkylene polyl component having been prepared by reacting an initiator having a functionality of about 2 to about 6 with said alkylene oxide component and having a hydroxyl number of about 200 to 800.

4,489,179

AQUEOUS POLYEPOXIDE EMULSIONS

Anthony J. Tortorello, Elmhurst, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed Jan. 23, 1984, Ser. No. 573,207

Int. Cl.³ C08L *63/10, 63/02*

U.S. Cl. 523—420 8 Claims

1. A room temperature-curing emulsion coating composition comprising a solution of normally solid polyepoxide polymer having a 1,2-epoxy equivalency of at least 1.4 and a molecular weight up to about 1000 in inert volatile organic solvent emulsified into water having dissolved therein a monosecondary amine containing at least one primary amine group which is ketimine blocked by reaction with a ketone which is hindered to prevent reaction with a secondary amino hydrogen atom, said hindered ketone being selected from the group consisting of noncyclic ketones containing one group selected from methyl or ethyl and a second group containing at least four carbon atoms, and cyclic ketones which are substituted in the alpha position, said monosecondary amine being dispersed in the water of the emulsion by at least 50% neutralization of amine functionality with a volatile solubilizing acid either as

such or after reaction into a polymer by means of its secondary amino hydrogen atom.

4,489,180

DRAG REDUCTION AGENT UTILIZING WATER SOLUBLE INTERPOLYMER COMPLEXES

Robert D. Lundberg, Bridgewater; Dennis G. Peiffer, East Brunswick; Ilan Duvdevani, Leonia, and Ralph M. Kowalik, Bridgewater, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 12, 1983, Ser. No. 560,515

Int. Cl.³ B63B *1/34*; C09K *3/00, 7/02*

U.S. Cl. 523—175 **10 Claims**

1. A method for reducing the frictional drag of an aqueous solution in flow through a pipe which method comprises adding a quantity of a water soluble polymer complex to said aqueous solution, said water soluble polymer complex comprising:

(a) a copolymer of a first water soluble polymer backbone and an anionic comonomer; and

(b) a copolymer of a second water soluble polymer backbone and a cationic comonomer.

4,489,181

THERMOPLASTIC POLYCARBONATE-POLYSULFONE CARBONATE MOLDING COMPOSITIONS

Daniel W. Fox, 193 Dawes Ave.; Robert R. Gallucci, 68 Winesap Rd., both of Pittsfield, Mass. 01201; Edward N. Peters, 51 West St., Lenox, Mass. 01240, and Gary F. Smith, 140 Churchill St., Pittsfield, Mass. 01201

Filed Nov. 7, 1983, Ser. No. 549,572

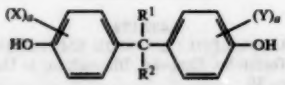
Int. Cl.³ C08K *3/34, 3/36, 3/40, 7/20*

U.S. Cl. 523—219 **9 Claims**

1. A thermoplastic filled molding composition which comprises:

(a) a blend of from 99 to 1 parts by weight of (i) an aromatic homo-polycarbonate derived from bisphenol-A and from 1 to 99 parts by weight of (ii) an aromatic polysulfone carbonate resin derived from:

(1) a diaryl phenol of formula I:



wherein R^1 and R^2 are hydrogen, (lower) alkyl of from 1 to 6 carbons or phenyl; X and Y are halogen; and a is 0, 1, 2, 3 or 4;

(2) a diaryl phenol of formula II:

wherein R^3 and R^4 may be the same or different and are (lower) alkyl of from 1 to 6 carbon atoms; b is 0 or 1 to 3, X, Y and a are the same as set forth in (i) and E is SO_2 or S;

(b) an effective amount of filler that increases the modulus of the composition.

4,489,182

RESINOUS COMPOSITIONS CURABLE THROUGH A TRANSESTERIFICATION CURING MECHANISM

Joseph T. Valko, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 29, 1981, Ser. No. 288,239

Int. Cl.³ C08L *63/02*

U.S. Cl. 523—414 **16 Claims**

13. The composition of claim 1 which is dispersed in aqueous medium and in which the polymeric polyol contains cationic salt groups.

4,489,183

STABILIZATION OF RED PHOSPHORUS

Helena Twardowska, Mississauga, Canada, assignor to ERCO Industries Limited, Islington, Canada

Filed Dec. 13, 1983, Ser. No. 561,039

Int. Cl.³ C01B *25/01*; C08K *3/32*; C08L *63/00, 61/28*

U.S. Cl. 523—440 **10 Claims**

1. A homogeneous blend of red phosphorus having a particle size of at most about 2 mm and a mixture of titanium in the form of titanium dioxide or titanium phosphate and an organic resin, said titanium being present in an amount of about 0.05 to about 1.0 wt.% and said organic resin being present in an amount of about 0.1 to about 5.0 wt.%, said organic resin being selected from the group consisting of an epoxy resin, a melamine-formaldehyde resin and a urea-formaldehyde resin.

4,489,184

MOLDING COMPOSITION

James A. Woelfel, 1818 Rockdale Ave., Lansing, Mich. 48917

Filed Sep. 26, 1983, Ser. No. 536,032

Int. Cl.³ C08L *63/10, 67/06*

U.S. Cl. 523—466 **20 Claims**

13. A molded vehicle wheel that exhibits excellent torque retention under conditions of high heat which comprises (1) from about 15 to about 40 weight percent of a molding composition which is comprised of from 30 to 70 weight percent of a vinyl ester resin and from 30 to 70 weight percent of a dicyclopentadiene polyester resin based on the total weight of said resins wherein said dicyclopentadiene polyester resin is a copolymer of the reaction product of a glycol, an unsaturated dicarboxylic acid or anhydride and dicyclopentadiene, (2) from about 35 to about 75 weight percent of a fiber reinforcement, and (3) from about 5 to about 40 weight percent of a filler.

4,489,185

CARBINOL-CONTAINING POLYIMIDES CAPABLE OF SELF-CROSSLINKING AT LOW TEMPERATURE

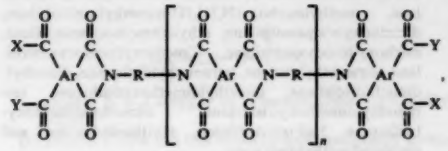
Jules E. Schoenberg, 2079 Lyde Pl., Scotch Plains, N.J. 07076

Continuation-in-part of Ser. No. 401,496, Jul. 26, 1982, abandoned, which is a continuation-in-part of Ser. No. 351,801, Feb. 24, 1982, abandoned. This application Sep. 26, 1983, Ser. No. 536,114

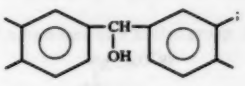
Int. Cl.³ C08G *73/10*

U.S. Cl. 524—104 **20 Claims**

1. A carbinol-containing polyimide curable at temperatures less than 200° C., which is prepared by reacting a molar excess of a 3,3',4,4'-benzhydrol tetracarboxylic acid compound selected from the group consisting of the tetraacid, diester-diacid, and dianhydride with a polyfunctional aliphatic, cycloaliphatic, heterocyclic, or aromatic primary amine using a molar ratio of between 2:1 and 9:8, the reaction being carried out in an inert organic solvent at a temperature sufficient to effect polymerization and imidization, the polyimide comprising a chain of recurring units having the formula:



wherein R is a divalent aliphatic, cycloaliphatic, aromatic, or heterocyclic radical; Ar is the same or different aromatic radical with the two pairs of attached carbonyl groups situated on adjacent carbon atoms in the Ar radical, wherein at least a substantial number of the Ar groups have the formula



X and Y are —OH, or X is —OH when Y is —OR′ or Y is —OH when X is —OR′, or X and Y together are an O group; R′ is the same or a different lower alkyl group; and n is 0 to 7.

4,489,186

POLYPHENYLENE ETHER RESIN COMPOSITION

Akitoshi Sugio, Ohmiya; Masanobu Masu, Toyonaka; Masao Okabe, Abiko, and Eiji Ukita, Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Jul. 5, 1983, Ser. No. 511,087

Claims priority, application Japan, Jul. 5, 1982, 57-116417

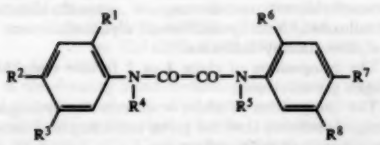
Int. Cl.³ C08K 5/20, 5/52

U.S. Cl. 524—151 **4 Claims**

1. A polyphenylene ether resin composition comprising

(1) a polyphenylene ether resin,

(2) 0.01 to 5 parts per 100 parts by weight of the polyphenylene ether resin of an oxanilide represented by the following formula



wherein R^1 and R^6 are identical or different and each represents a hydrogen atom, an alkyl group having 1 to 8 carbon atoms, or an alkoxy group having 1 to 15 carbon atoms, R^2 and R^7 are identical or different and each represents a hydrogen atom, an alkyl group having 1 to 8 carbon atoms, or an alkoxy group having 1 to 10 carbon atoms, R^3 and R^8 are identical or different and each represents a hydrogen atom or an alkyl group having 1 to 8 carbon atoms, and R^4 and R^5 are identical or different and each represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, or a dialkylaminoalkyl group with the alkyl moiety having 1 to 6 carbon atoms

(3) 0.01 to 5 parts per 100 parts by weight of the polyphenylene ether resin of an organic phosphite, and

(4) 0.5 to 5 parts per 100 parts by weight of the polyphenylene ether resin of a sterically hindered phenol.

4,489,187

HEAT-RESISTANT BLENDS OF POLYPROPYLENE, CONJUGATED DIENE/MONOVINYLARENE RUBBERY BLOCK COPOLYMERS, WITH AN IN-SITU CURED POLYCHLOROPRENE

Terence C. Middlebrook, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 29, 1984, Ser. No. 584,674

Int. Cl.³ C08K 5/39

U.S. Cl. 524—201 **20 Claims**

1. A polymer blend comprising effective ratios to maintain stability at high temperature aging of a polypropylene, a conjugated diene/monovinylarene rubbery block copolymer, a polychloroprene, and a curative effective to cure substantially only the polychloroprene component.

4,489,188

COALESCENT-CONTAINING COATING COMPOSITION

Glenn C. Jones, and Larry J. Culver, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

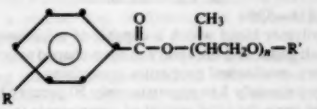
Continuation-in-part of Ser. No. 394,557, Jul. 2, 1982, Pat. No. 4,435,534. This application Oct. 26, 1983, Ser. No. 545,707

The portion of the term of this patent subsequent to Mar. 6, 2001, has been disclaimed.

Int. Cl.³ C08K 5/10

U.S. Cl. 524—292 **9 Claims**

1. A coating composition comprising a latex of a normally solid organic addition polymer and a coalescing amount of at least one ether-ester solvent having the formula



where R represents hydrogen or an alkyl group of 1 to 4 carbon atoms, R′ represents a C_1–C_4 alkyl group, and n is 1 or 2.

4,489,189

ALKANEDIYL BROMO-SUBSTITUTED ARYLENEDIYL CARBONATE POLYMERS

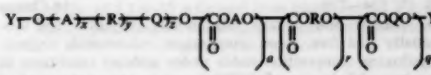
Nicodemus E. Boyer, Schaumburg, Ill., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 8, 1983, Ser. No. 521,475

Int. Cl.³ C08G 63/62

U.S. Cl. 524—409 **17 Claims**

1. Carbonate polymer diagrammatically represented by the formula



wherein

a. each A is (1-methylethylidene)bis(2,6-dibromo-4,1-phenylene),

b. each R is 1,2-ethanediyl,

c. each Q is individually a divalent organo group, other than A or R, having at least two carbon atoms between the two valences thereof,

d. Y_1 of each molecule of the carbonate polymer is independently hydrogen or

where Y_3 is a monovalent organo group,

e. Y_2 of each molecule of the carbonate polymer is independently hydrogen or

where Y_4 is a monovalent organo group,

f. the average value of each of x, y and z is in the range of from 0 to 1,

g. the sum of the average values of a and x is in the range of from 2 to about 8,

h. the sum of the average values of r and y is in the range of from 1 to about 8,

i. the sum of the average values of q and z is in the range of from 0 to about 8,

provided that

j. the sum of the average values of x, y and z is 1,

k. the sum of the average values of a and x is greater than the sum of the average values of r and y, and

l. the sum of the average values of a and x is greater than or equal to the sum of the average values of q and z.

4,489,190

BLEND OF POLYALKYLENE TEREPHTHALATE AND WHOLLY AROMATIC POLYESTER

Michael F. Froix, Menlo Park, Calif., assignor to Celanese Corporation, New York, N.Y.

Filed Jun. 11, 1980, Ser. No. 158,547
Int. Cl.³ C08L 67/00
U.S. Cl. 524—539 **34 Claims**

1. A polymer blend which is capable of exhibiting an anisotropic melt phase and the ability to form shaped articles having satisfactory mechanical properties comprising:

(a) approximately 5 to approximately 50 percent by weight, based upon the total weight of components (a) and (b), of a polyalkylene terephthalate wherein the alkylene units contain B 2 to 5 carbon atoms, and

(b) approximately 50 to approximately 95 percent by weight, based upon the total weight of components (a) and (b), of a melt processable wholly aromatic polyester which is capable of forming an anisotropic melt phase apart from said blend.

4,489,191

SILANE SCAVENGERS FOR HYDROXY RADICALS CONTAINING SILICON-HYDROGEN BONDS

Rack H. Chung, deceased, late of Clifton Park, N.Y. (by Betsy A. Chung, executrix), assignor to General Electric Company, Waterford, N.Y.

Filed Aug. 31, 1983, Ser. No. 528,274
Int. Cl.³ C08K 3/08
U.S. Cl. 524—779 **14 Claims**

1. A stable, one package, substantially anhydrous and substantially acid free, room temperature vulcanizable organopolysiloxane composition stable under ambient conditions in the substantial absence of moisture over an extended period of time and convertible to a tack-free elastomer, comprising:

(A) a polydiorganosiloxane base polymer wherein the silicon atom at each chain end is terminated with at least two alkoxy radicals;

(B) an effective amount of condensation catalyst; and

(C) a stabilizing amount of scavenger for hydroxy functional groups selected from the group consisting of trimethoxysilane, triethoxysilane, methyldimethoxysilane, ethyldiethoxysilane, methyldiethoxysilane, ethyldimethoxysilane, dimethoxy(ethylmethylketoximo)silane, methylmethoxy(ethylmethylketoximo)silane, dimethoxy(N-methylcarbamato)silane, ethylmethoxy(N-methylcarbamato)silane, methylisopropenoxysilane, methylmethoxyisopropenoxysilane, dimethoxyisopropenoxysilane, methyldi-isopropenoxysilane, ethylmethoxy(N-ethylpropionamido)silane, methyldi(N-methylbenzamido)silane, dimethoxy(N-methylacetamido)silane, methyldimethoxyacetimidatosilane, methylmethoxy(N,N¹,N¹-trimethylureido)silane, dimethoxyisocyanatosilane, ethylethoxyisocyanatosilane, methoxydiisocyanatosilane, dimethoxythioisocyanatosilane, tetramethyldisilane, tetramethyldisiloxane, dimethyldimethoxydisilane, dimethyldimethoxydisiloxane, tetramethyldimethoxytrisiloxane, tetraethyldimethoxytrisiloxane, 3-siloxytrisilthiane, silylthiodisiloxane, and silylthiodimethyldisiloxane.

2. A stable, one package, substantially anhydrous and substantially acid-free room temperature vulcanizable organopolysiloxane composition stable under ambient conditions in the substantial absence of moisture over an extended period of time and convertible to a tack-free elastomer, comprising:

(A) a silanol terminated polydiorganosiloxane base polymer;

(B) an effective amount of a crosslinking silane of the formula

where R^7 is a $C_{(1-8)}$ aliphatic organic radical selected from the group consisting of alkyl, alkylether, alkylester, alkylketone and alkylcyano radicals or a $C_{(7-13)}$ aralkyl radical; R^8 is a $C_{(1-13)}$ monovalent substituted or unsubstituted hydrocarbon radical, and h equals 0 or 1;

(C) an effective amount of condensation catalyst; and

(D) a stabilizing amount of scavenger for hydroxy functional groups selected from the group consisting of trimethoxysilane, triethoxysilane, methyldimethoxysilane, ethyldiethoxysilane, methyldiethoxysilane, ethyldimethoxysilane, dimethoxy(ethylmethylketoximo)silane, methylmethoxy(ethylmethylketoximo)silane, dimethoxy(N-methylcarbamato)silane, ethylmethoxy(N-methylcarbamato)silane, methylisopropenoxysilane, methylmethoxyisopropenoxysilane, dimethoxyisopropenoxysilane, methyldi-isopropenoxysilane, ethylmethoxy(N-ethylpropionamido)silane, methyldi(N-methylbenzamido)silane, dimethoxy(N-methylacetamido)silane, methyldimethoxyacetimidatosilane, methylmethoxy(N-N¹,N¹-trimethylureido)silane, dimethoxyisocyanatosilane, ethylethoxyisocyanatosilane, methoxydiisocyanatosilane, dimethoxythioisocyanatosilane, tetramethyldisilane, tetramethyldisiloxane, dimethyldimethoxydisilane, dimethyldimethoxydisiloxane, tetramethyldimethoxytrisiloxane, tetraethyldimethoxytrisiloxane, 3-siloxytrisilthiane, silylthiodisiloxane and silylthiodimethyldisiloxane.

6. The composition of claim 1 or 2 further comprising a hydrogen gas scavenger.

7. The composition of claim 6 wherein the hydrogen gas scavenger is selected from the group consisting of unsaturated hydrocarbons and molecular sieves.

4,489,192

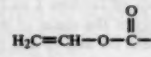
CATIONIC VINYL ESTER BASED POLYMER LATICES, THEIR PREPARATION AND USE AS FORMALDEHYDE-FREE BINDERS

Yen-Jer Shih, Piscataway, and Carmine P. Iovine, Bridgewater, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Oct. 5, 1983, Ser. No. 539,038
Int. Cl.³ C08L 33/24, 33/14
U.S. Cl. 524—813 **20 Claims**

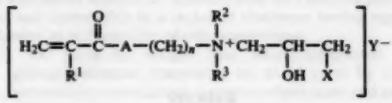
1. A high solids, low viscosity, alkaline-curable, thermosetting cationic vinyl ester based polymer latex, which is prepared by polymerizing a mixture of

(a) at least about 5% of a vinyl ester having the formula



wherein R is a straight or branched chain C_1–C_6 alkyl group;

(b) about 0.1–10% of a functional cationic quaternary ammonium monomer having the formula



where R^1 is hydrogen or a methyl group; A is —O— or

with R^4 being hydrogen or a C_1–C_3 alkyl group; R^2 and R^3 are independently C_1–C_6 alkyl groups; X is a halogen, Y is an anion; and n is 1–4; and

(c) 0–94.9% of a vinyl polymerizable monomer; the polymerization being carried out in the presence of water, an effective amount of a water-soluble cationic azo initiator and a water-soluble, substantially non-partitioning amino thiol salt chain transfer agent, and an emulsion-stabilizing amount of a cationic or nonionic surfactant or mixtures thereof; the monomer percentages being by weight and totaling 100%; the self-crosslinking cationic polymer having a higher molecular weight than the same polymer prepared by carrying out the polymerization in the presence of a chain transfer agent other than the water-soluble, substantially non-partitioning amino thiol salt chain transfer agent.

4,489,193

BLEND OF INTERNALLY PLASTICIZED VINYL CHLORIDE COPOLYMER AND ETHYLENE/CARBON MONOXIDE POLYMER

Jagadish C. Goswami, New City, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jan. 30, 1981, Ser. No. 229,818
Int. Cl.³ C08L *27/06, 101/06*
U.S. Cl. 525—190 **3 Claims**

1. A film-forming blend containing an internally plasticized vinyl chloride copolymer which comprises from about 50% to about 85%, by weight, vinyl chloride, from about 3% to about 47%, by weight, of a C_6–C_{10} alkyl acrylate, and from about 47% to about 3%, by weight, of a bis(hydrocarbyl)vinylphosphonate with an effective amount of an ethylene/carbon monoxide terpolymer to improve the physical properties of a film formed therefrom.

4,489,194

CARBOXYLIC ACYLATING AGENTS SUBSTITUTED WITH OLEFIN POLYMERS OF HIGH/LOW MOLECULAR WEIGHT MONO-OLEFINS, DERIVATIVES THEREOF, AND FUELS AND LUBRICANTS CONTAINING SAME

Katsumi Hayashi, Mentor, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Aug. 9, 1982, Ser. No. 404,847
Int. Cl.³ C08F *255/08, 255/10*
U.S. Cl. 525—193 **45 Claims**

1. A composition comprising: the reaction product of (I):

(A) one or more alpha-beta olefinically unsaturated carboxylic reagents containing two to about 20 carbon atoms exclusive of the carboxyl-based groups reacted with

(B) one or more olefin polymers of at least 30 carbon atoms selected from the group consisting of

(i) interpolymers of C_4 mono-1-olefins with C_{12}–C_{30} mono-olefins with the proviso that said interpolymers exclude interpolymers derived from ethylene,

(ii) mixtures of (a) homopolymers and/or interpolymers of C_4 mono-1-olefins with (b) homopolymers and/or interpolymers of C_{12}–C_{30} mono-olefins and

(iii) chlorinated or brominated analogs of (i) or (ii);

reacted with (II) one or more amines, one or more alcohols, or a mixture of one or more amines and/or one or more alcohols; with the proviso that the reaction product of (I) and (II) is soluble in an oil of lubricating viscosity.

4,489,195

PROCESS FOR PRODUCING THERMOPLASTIC OLEFINIC ELASTOMER

Shigeru Saeda, and Zenichiro Izumi, both of Ohita, Japan, assignors to Showa Denko K.K., Tokyo, Japan

Continuation of Ser. No. 306,930, Sep. 29, 1981, abandoned. This application Jan. 31, 1983, Ser. No. 462,148
Claims priority, application Japan, Sep. 30, 1980, 55-135248
Int. Cl.³ C08F *297/08*
U.S. Cl. 525—323 **3 Claims**

1. A process for producing a thermoplastic elastomer by a slurry polymerization technique in the presence of a Ziegler catalyst, which comprises a first step of forming polypropylene and then a second step of forming an ethylene/propylene random copolymer, wherein

(a) the catalyst is composed of (1) a solid component containing titanium, magnesium and chlorine and (2) an organoaluminum compound, with or without (3) a third component, and the catalyst is used such that the total amount of the elastomer formed is at least 50 kg per gram of the titanium metal in the catalyst,

(b) propylene is used as a slurry polymerization solvent as well as a starting material,

(c) the solvent phase of the slurry is evaporated and separated without bringing the resulting elastomer into contact with alcohols and/or hydrocarbons having at least 5 carbon atoms,

(d) the polymerization temperature in the second step is adjusted to not more than 50° C., and

(e) in the first step, polypropylene is formed in an amount of 5 to 38.3% by weight based on the total weight of the elastomer, and in the second step, the ethylene/propylene random copolymer having a propylene content of 5 to 60% based on the weight of the ethylene/propylene random copolymer and an intrinsic viscosity at 135° C. in decalin of 1.5 to 15 is formed in an amount of 61.7 to 95% by weight based on the total weight of the elastomer.

4,489,196

CURABLE FLUOROPOLYMER COMPOSITION

Walter W. Schmiegel, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 26, 1983, Ser. No. 488,629
Int. Cl.³ C08J *3/24*
U.S. Cl. 525—326.3 **6 Claims**

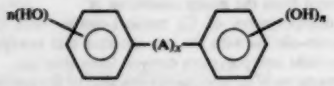
1. A curable composition comprising:

(A) a copolymer containing polymerized vinylidene fluoride units, and polymerized hexafluoropropylene units, or polymerized chlorotrifluoroethylene units, or polymerized 1-hydropentafluoropropylene units or polymerized 2-hydropentafluoropropylene units,

(B) a quaternary phosphonium or quaternary ammonium vulcanization accelerator,

(C) a crosslinking agent selected from the group consisting of dihydroxy-, trihydroxy- and tetrahydroxy- -benzenes,

-naphthalenes and -anthracenes having an aromatic ring, and bisphenols of the formula



wherein A is a difunctional radical, x is 0 or 1 and n is 1 or 2,

(D) a polyol coaccelerator selected from the class consisting of pentaerythritol, 2,2-dimethyl-1,3-propanediol, dipentaerythritol, and trimethylol propane.

(E) a metal compound selected from the group consisting of divalent metal oxide, divalent metal hydroxide and mixtures of such oxides and hydroxides with metal salts of weak acids.

said composition containing for each 100 parts by weight of component A, about 0.2 to 2 parts by weight of component (B), about 0.5 to 4 parts of component (C), about 0.05 to 4 parts of component (D), and 0.5 to 30 parts of component (E).

4,489,197

POLYMERIC ACTIVE METHYLENE COMPOUNDS

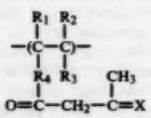
Patricia C. Wang, Palo Alto, and Daniel J. Dawson, Los Altos, both of Calif., assignors to Dynapol, Palo Alto, Calif.

Continuation of Ser. No. 319,624, Nov. 9, 1981, abandoned. This application Feb. 17, 1984, Ser. No. 580,758

Int. Cl.³ C08F 8/30

U.S. Cl. 525—328.2 **12 Claims**

1. A polymer comprising a repeat unit of the structure



wherein X is O or N—, R_1, R_2 and R_3 are independently selected from hydrogen and 1-4 carbon lower alkyls and R_4 is selected from among

aromatic amines, and aromatic hydrazines which additionally provide X is N—.

4,489,198

POLYMERIZATION OF ETHYLENE WITH A CATALYST COMPRISING SEVERAL TRANSITION METAL COMPOUNDS

Karel Bujadoux, Lens, France, assignor to CdF Chimie S.A. Societe Chimique des Charbonnages, Paris, France

Division of Ser. No. 218,095, Dec. 19, 1980, Pat. No. 4,388,219. This application Mar. 22, 1983, Ser. No. 477,846

Claims priority, application France, Dec. 28, 1979, 79 31911

Int. Cl.³ C08F 4/64, 10/02

U.S. Cl. 526—114 **9 Claims**

1. A process for polymerizing ethylene at a pressure between 300 and 2,500 bar and at a temperature between 180° C. and 300° C., comprising bringing ethylene into the presence of a catalytic system comprising (a) at least one catalyst comprising at least two halogen compounds of transition metals, one of which is a titanium trichloride syncrystallized with aluminum chloride, having a formula:

$$(TiCl_3, \tfrac{1}{3}AlCl_3)\ (MX_3)_z\ (MgX_2)_y$$

wherein $0.3 \leq x \leq 3$, $0 \leq y \leq 20$, M is a transition metal of Group V B and VI B of the Periodic System and X is a halogen, and (b) at least one activator selected from the hydrides and organometallic compounds of Groups I to III of the Periodic System, the atomic ratio of the metal of the activator to the sum Ti+M lying between 0.1 and 10 and the mean residence time of the catalytic system in the polymerization reactor lying between 2 and 100 seconds.

4,489,199

ROOM TEMPERATURE VULCANIZABLE ORGANOPOLYSILOXANE COMPOSITIONS

Jeffrey H. Wengrovius, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 8, 1983, Ser. No. 520,974

Int. Cl.³ C08G 77/06

U.S. Cl. 528—16 **18 Claims**

1. A room temperature vulcanizable organopolysiloxane composition comprising on a weight basis

(A) 100 parts of a silanol or alkoxy-terminated polydiorganosiloxane

(B) 0.1 to 10 parts of polyalkoxy silane

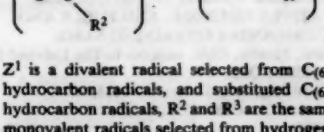
(C) 0.3 to 1 part of a curing accelerator selected from the class consisting of amines, silazanes and silyl-substituted guanidines, or mixtures thereof and

(D) 0.1 to 10 parts of an aluminum complex curing catalyst whose valence bonds are satisfied by at least one G radical selected from the class consisting of $—OR^1$, $—OSi(R^1)_3$ and $—SR^1$, R^1 is a monovalent radical selected from $C_{(1-13)}$ hydrocarbon radicals and substituted hydrocarbon radicals, or a divalent radical of the formula,

$$—D—Z—D—,$$

D is a divalent radical selected from —O—, —N— and —S— and mixtures thereof, Z is a divalent radical selected from $C_{(6-13)}$ arylene and $C_{(1-8)}$ alkylene, and when D is —O—, Z also can be

where b has a value of 0 to 5 inclusive and where the balance of the valence bonds of the aluminum atom of such complex is satisfied by at least one monovalent anion selected from



Z^1 is a divalent radical selected from $C_{(6-13)}$ aromatic hydrocarbon radicals, and substituted $C_{(6-13)}$ aromatic hydrocarbon radicals, R^2 and R^3 are the same or different monovalent radicals selected from hydrogen, R^1, $—OR^1$, $OSi(R^1)_3$, acyl and nitrile R^4 is a monovalent radical selected from hydrogen, R^1 and OR^1.

4,489,200

ONE-COMPONENT RTV SILICONE RUBBER COMPOSITIONS WITH GOOD SELF-BONDING PROPERTIES TO ACRYLATE PLASTICS

John J. Dziark, Ballston Spa, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Apr. 11, 1983, Ser. No. 483,969
Int. Cl.³ C08G 77/06
U.S. Cl. 528—18 15 Claims

1. A stable, one-package substantially anhydrous and substantially acid-free, room temperature vulcanizable organopolysiloxane composition stable under ambient conditions in the substantial absence of moisture over an extended period of time and convertible to a tack-free elastomer having superior adhesion to polyacrylate plastic comprising:

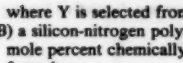
(i) 100 parts by weight base alkoxy-terminated diorganopolysiloxane comprising up to 50 parts by weight monoalkoxy-terminated diorganopolysiloxane and at least 50 parts by weight polyalkoxy-terminated diorganopolysiloxane; and

(ii) a pre-reacted catalyst mixture comprising the reaction product of

(1) 0.001 to 10 parts by weight per 100 parts by weight of (i) of a tin condensation catalyst,

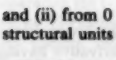
(2) 0.5 to 10 parts by weight per 100 parts by weight of (i) of a scavenger for hydroxy functional groups which is a silicon-nitrogen compound selected from the group consisting of

(A) a silicon-nitrogen compound having the formula



where Y is selected from R''' and $(R'')_2N$ and

(B) a silicon-nitrogen polymer comprising (i) from 3 to 100 mole percent chemically combined structural units of the formula

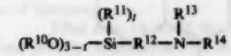


and (ii) from 0 to 97 mole percent chemically combined structural units represented by the formula

$$(R''')_cSiO_{(4-c)/2}$$

where the silicon atoms of said compound are joined to each other by a member selected from an SiOSi linkage and a SiNR''Si linkage, the free valences of said silicon atoms other than those joined to oxygen to form a siloxy unit or to nitrogen to form a silazy unit are joined to a member selected from an R''' radical and an $(R'')_2N$ radical, where the ratio of the sum of said R''' radicals and said $(R'')_2N$ radicals to the silicon atoms of said polymer has a value of 1.5 to 3 inclusive, R'' and R''' are independently selected from the group consisting of hydrogen, monovalent hydrocarbon radicals and monovalent fluoroalkyl radicals, and c is a whole number equal to 0 to 3 inclusive, and

(3) 0.1 to 10 parts by weight per 100 parts by weight of (i) of an adhesion promoter having the formula



where R^{10} and R^{11} are $C_{(1-8)}$ monovalent hydrocarbon radicals, t varies from 0 to 2, R^{12} is a $C_{(2-12)}$ divalent hydrocarbon radical, R^{13} and R^{14} are selected from the group consisting of hydrogen, amine radicals, $C_{(1-8)}$ aminofunctional alkyl radicals and $C_{(1-8)}$ monovalent hydrocarbon radicals, and mixtures thereof.

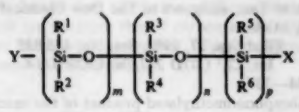
4,489,201

FLUOROALKYLOXYLAKYL CONTAINING ORGANOPOLYSILOXANES

Günter von Au, Paganiniweg 8; Ernst Innertsberger, Mehringer Strasse 56, both of 8263 Burghausen; Jakob Schmidlkofer, Ahornweg 3, 8261 Mehring-Öd, and Wolfgang Kaiser, Robert-Koch-Strasse 134, 8263 Burghausen, all of Fed. Rep. of Germany

Filed Nov. 21, 1983, Ser. No. 553,950
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1982, 3248535
Int. Cl.³ C08G 77/24
U.S. Cl. 528—42 4 Claims

1. A diorganopolysiloxane having the general formula



where R^1 represents fluoroalkyloxyalkyl groups of the formula

$$-(CH_2)_a-O-C_bF_{2b}H$$

in which the hydrogen atom is in the beta position relative to the ether oxygen; a is 2, 3 or 4; b is an integer of from 1 to 6; R^2 is selected from the group consisting of an alkyl group having from 1 to 8 carbon atoms, an alkenyl group having 2 or 3 carbon atoms, an aryl group having 6 to 8 carbon atoms and hydrogen; R^3 represents the group

$$-(CH_2)_c-C_dF_{2d-e+1)}Hal_e$$

where Hal represents a terminal halogen group selected from the class consisting of chlorine, bromine and iodine; c is 2, 3 or 4; d is an integer having a value of from 1 to 18; e is 0 or 1; R^4, R^5 and R^6 are each selected from the group consisting of an alkyl group having from 1 to 8 carbon atoms, an alkenyl group having 2 or 3 carbon atoms, an aryl group having 6 to 8 carbon atoms and hydrogen; X and Y are each selected from the group consisting of condensable terminal groups and trialkylsiloxy groups in which the alkyl groups have from 1 to 6 carbon atoms; m has a value of from 0.05 to 0.9; n has a value of from 0 to 0.6; and p has a value of from 0.1 to 0.8; with the proviso that the sum of m+n+p=1.

4,489,202

PROCESS FOR PREPARING EPOXY RESINS CONTAINING TRIAZINE GROUPS

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 31, 1983, Ser. No. 547,537
Int. Cl.³ C08G 59/06, 59/20
U.S. Cl. 528—95 36 Claims

1. A process for preparing epoxy resins containing triazine groups which process comprises (I) reacting (A) at least one material having an average of more than one aromatic hydroxyl group per molecule with (B) at least 0.01 but not more than 0.95 moles of cyanogen halide or mixture of cyanogen halides per aromatic hydroxyl group in the presence of (C) a suitable base in a quantity of from about 0.01 to about 1.1 moles per aromatic hydroxyl group at a temperature and time sufficient to essentially complete the reaction and thereafter recovering the resultant cyanate mixture; (II) trimerizing the product resulting from (I) in the presence of a suitable trimerization catalyst at a temperature and time to essentially complete the trimerization reaction; (III) epoxidizing the resultant trimer-

ized product from step (II) in a conventional manner by reaction with an epihalohydrin with subsequent dehydrohalogenation with a basic-acting material and finally recovering the resultant glycidyl ether product.

10. A cyanate mixture resulting from reacting (A) at least one material having an average of more than one aromatic hydroxyl group per molecule with (B) at least 0.01 but not more than 0.95 moles of cyanogen halide or mixture of cyanogen halides per aromatic hydroxyl group in the presence of (C) a suitable base in a quantity of from about 0.01 to about 1.1 moles per aromatic hydroxyl group at a temperature and time sufficient to essentially complete the reaction and thereafter recovering the resultant cyanate mixture.

4,489,203

POLYUMERIC ALKYLENE PHOSPHORIC ACID PIPERAZINE DERIVATIVES AS SCALE INHIBITORS

David A. Wilson, Richwood, and Druce K. Crump, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 27, 1982, Ser. No. 425,025
Int. Cl.³ C07D 241/04; C02F 5/14
U.S. Cl. 544—337 3 Claims

1. The phosphonomethylated product of the reaction of (1) aminoethylpiperazine with (2) a dihalo saturated or unsaturated aliphatic hydrocarbon having from 2 to 6 carbon atoms or a haloepoxy saturated aliphatic hydrocarbon having from 3 to 5 carbon atoms wherein the mole ratio of dihalo or haloepoxy compound to the amine compound is from about 0.20 to about 0.80.

4,489,204

CATALYST FOR THE PREPARATION OF PHTHALIC ANHYDRIDE

Amleto Neri, Bergamo; Lorenzo Capitanio, Mozzo, and Giancarlo Stefani, Gorle, all of Italy, assignors to Alusuisse Italia S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 247,357, Mar. 25, 1981, Pat. No. 4,405,505. This application Dec. 27, 1982, Ser. No. 453,117
Claims priority, application Italy, Apr. 2, 1980, 21134 A/80
Int. Cl.³ C07D 307/89
U.S. Cl. 549—248 3 Claims

1. A method of producing phthalic anhydride consisting of contacting a feed mixture comprising a vapor phase reagent chosen between o-xylol and naphthalene and air with a catalyst, characterized in that said catalyst comprises as the active component thereof a mixture of vanadium pentoxide and titanium dioxide in a 1:5 to 1:20 ratio by weight, said titanium dioxide having more than 50% of the total pore volume thereof with radii in the 500 to 1,500 Ångstrom range, said active component being distributed over an inert support or carrier comprising half-rings, and in that said feed mixture comprises a ratio by weight of air to said reagent of from 10:1 to 22:1.

4,489,205

PREPARATION OF A GLUTARALDEHYDE PRECURSOR

Nan S. Chu, Hartsdale, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 266,102, May 21, 1981, abandoned. This application Jun. 28, 1983, Ser. No. 507,976
Int. Cl.³ C07D 309/10; C07C 47/12
U.S. Cl. 549—417 10 Claims

1. A process for producing a glutaraldehyde precursor composition substantially free of glutaraldehyde which consists essentially of hydrating 2-alkoxy-3,4-dihydropyran in contact with an acid catalyst at a temperature of from about 30° to about 100° C. without refluxing and under such reaction conditions sufficient to produce essentially said precursor, wherein the molar ratio of water to 2-alkoxy-3, 4-dihydropyran is from about 1:1 to about 3:1 and wherein the alkoxy group contains from 1 to 3 carbon atoms.

5. A process for producing an agueous solution of glutaraldehyde which comprises adding the glutaraldehyde precursor composition produced by the process of claim 1 to water.

6. The glutaraldehyde precursor composition produced by the process of claim 1 comprising principally 2-hydroxy-6-methoxytetrahydropyran.

4,489,206

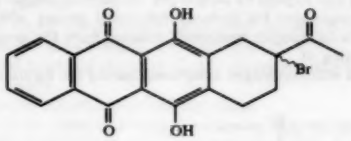
SYNTHESIS OF (+)-4-DEMETHOXYDAUNOMYCINONE

Michael P. Cava, Wynnewood, Pa., and Domingo Dominguez, Santiago de Compostela, Spain, assignors to Adria Laboratories, Inc., Columbus, Ohio

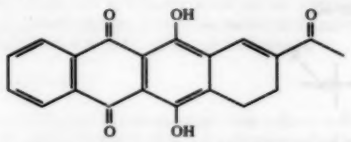
Filed May 13, 1983, Ser. No. 494,247
Int. Cl.³ C07C 50/36; C07D 303/37
U.S. Cl. 549—543 5 Claims

1. A process for making R(−)-4-demethoxy-7-deoxydaunomycinone comprising

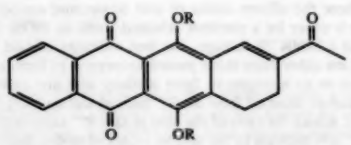
(a) selectively brominating 8-acetyl-6,11-dihydroxy-7,8,9,10-tetrahydro-5,12-naphthacenedione to form its 8-bromo derivative having the formula



(b) dehydrohalogenating the 8-bromo derivative with an alkali carbonate to form the enone derivative having the formula

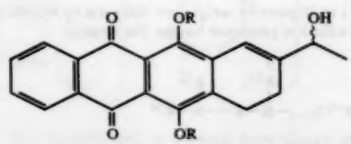


(c) esterifying the enone derivatives with a lower carboxylic acid anhydride to form the diester derivative having the formula



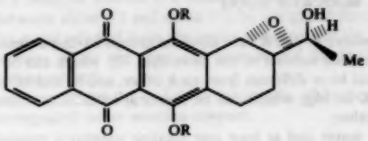
where R is a lower alkyl acyl radical.

(d) reducing the diester derivative with sodium borohydride to give the racemic allylic alcohol having the formula

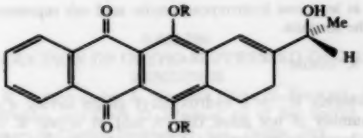


(e) asymmetrically epoxidizing the racemic allylic alcohol with titanium isopropoxide, (+)-diisopropyl L-tartrate and an alkyl hydroperoxide to give a mixture of the ery-

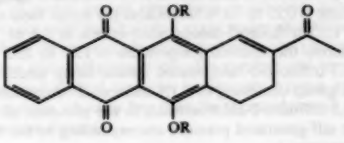
thro epoxide (−) and the R (+) allylic alcohol having the formulas



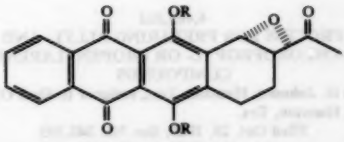
and



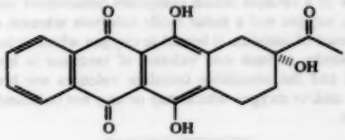
(f) oxidizing the above mixture with chromic acid to give a mixture of the (−)-epoxy ketone and the diester derivative having the formulas



and



(g) separating the (−)-epoxy ketone from the diester derivative by crystallization and reducing (−)-epoxy ketone with sodium dithionite to give R(−)-4-demethoxy-7-deoxydaunomycinone having the formula



4,489,207

PREPARATION OF 2-(HYDROXYPHENOXY)-CARBOXYLATES

Rainer Becker, Bad Durkheim; Heinz-Günter Oeser, Dirnstein, and Rolf-Dieter Acker, Leimen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

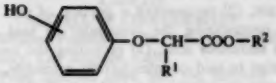
Filed Dec. 16, 1982, Ser. No. 450,380

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1981, 3150233

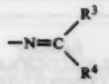
Int. Cl.³ C07C *69/76*

U.S. Cl. 560—61 **6 Claims**

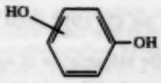
1. A process for the preparation of a 2-(hydroxyphenoxy)-carboxylate of the formula:



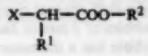
where R^1 is hydrogen or a low molecular weight alkyl group, and R^2 is a saturated or unsaturated hydrocarbon radical of no more than 10 carbon atoms which is unsubstituted or substituted by diphenoxy, cyano, halogen or trialkylsilyl, or is a radical of the formula:



where R^3 and R^4 are each identical or different hydrocarbon radicals which are no more than 9 carbon atoms together or R^3 and R^4 are bonded to one another, which comprises reacting a compound of the formula:



with a 2-halo-fatty acid ester of the formula:



where R^1 and R^2 have the above meanings and X is chlorine or bromine, in the presence of calcium hydroxide as the base, in dimethylsulfoxide, at from 0° to +100° C., the molar ratio of the starting material II:III at the beginning of the reaction being not less than 1.5:1.

4,489,208

PROCESS FOR PRODUCING D(−)MANDELIC ACID

Roberto Olivieri, Mentana; Giancarlo Eletti Bianchi, Rome; Eugenio Fascetti, Rome; Felice Centini, Rome; Ludwig Degen, Rome, and Walter Marconi, San Donato Milanese, all of Italy, assignors to E.N.I. Nazionale Idrocarburi, Rome, Italy

Division of Ser. No. 188,074, Sep. 17, 1980,. This application Feb. 16, 1982, Ser. No. 348,707

Claims priority, application Italy, Oct. 17, 1979, 26547 A/79

Int. Cl.³ C07C *59/50*

U.S. Cl. 562—470 **1 Claim**

1. A process for producing D(−)mandelic acid consisting of subjecting 5-phenyl-2,4-oxazolidinedione to stereoselective enzymatic hydrolysis and forming D(−)mandelic acid carbamate, subjecting said D(−) mandelic acid carbamate to acid hydrolysis in an aqueous environment at a temperature of between 40° C. and 100° C. at a pH between 1 and 3.5 and obtaining said D(−)mandelic acid.

4,489,209

SEPARATION OF AMINES BY PREFERENTIAL AQUEOUS SALT EXTRACTION

Tzu-Ching Chang, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 17, 1981, Ser. No. 331,894

Int. Cl.³ C07C *85/26*

U.S. Cl. 564—425 **6 Claims**

1. A process of separating two or more water immiscible amines having a basicity K_B of from 1×10^{-10} to 20×10^{-10} and a difference in basicity K_B of at least about 1.5:1 comprising (1) feeding a mixture of such amines to a mid point of a

countercurrent extractor, (2) removing an organic phase containing the less reactive amine from one end of said countercurrent extractor, (3) recovering a portion of said less reactive amine, (4) neutralizing the remainder of said less reactive amine with sulfurous acid, (5) recycling the neutralized less reactive amine to said countercurrent extractor, removing an aqueous phase containing the acid salt of the more reactive amine(s) from said countercurrent extractor, (6) reforming the free more reactive amine(s) while recovering SO_2 which is used to neutralize the less reactive amine in step (4) above, (7) removing the aqueous phase from such free more reactive amine(s) (8) removing a portion of said more reactive amine(s) from the system, and (9) returning the remaining portion of such free amine(s) to said countercurrent extractor.

4,489,210

PROCESS FOR THE HALOGENATION OF ORGANIC COMPOUNDS

Helmut Judat, Langenfeld; Ulrich Schnegg, Leverkusen, and Karlfried Wedemeyer, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 30, 1982, Ser. No. 403,399

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1981, 3132692

Int. Cl.³ C07C *39/24*

U.S. Cl. 568—779 **14 Claims**

1. A process for the halogenation of an organic compound which

(1) is polyhalogenatable

(2) is halogenated with a gaseous halogenating agent to form more mono halogenated organic compound when halogenated with gas bubbles of 3 mm in diameter than is formed when said gas bubble has a diameter of 1 mm

in the liquid phase which comprises feeding said gaseous halogenating agent to a liquid phase containing said organic compound at a temperature of 0° to 150° C. in the form of a gas jet at the point said halogenating agent enters the reaction vessel whereby the formation of bubbles is prevented, said halogenating agent being chlorine, bromine or iodine.

4,489,211

PROCESS FOR PRODUCING 2,2,2-TRIFLUOROETHANOL

Eiji Ogura; Kunihiro Mito, and Shoji Arai, all of Sinnanyo, Japan, assignors to Onoda Cement Co., Ltd., Onoda and Toyo Soda Manufacturing Co., Ltd., Shinnanyo, both of, Japan

Filed Feb. 1, 1983, Ser. No. 463,019

Claims priority, application Japan, Feb. 4, 1982, 57-16821; Feb. 9, 1982, 57-19493

Int. Cl.³ C07C *31/34, 29/09*

U.S. Cl. 568—842 **6 Claims**

1. A process for producing 2,2,2-trifluoroethanol, which comprises reacting an 1,1,1-trifluoro-2-halogenated ethane in γ-butyrolactone used as a solvent in the presence of at least one of the following reagent systems (a) to (e):

(a) water and at least one carboxylic acid salt represented by the general formula

RCOOM

wherein R is an alkyl group or a hydroxyalkyl group, each of which has a carbon number of not more than 19, or phenyl group, and M is Na, K, or Mg;

(b) water and at least one dicarboxylic acid salt represented by the general formula

MOOCR'COOM'

wherein R' is an alkylene group, having a carbon number of 0 to 8, or phenylene group, and M and M' are Na, K or Mg, which can be identical or different from each other;

(c) water and at least one dicarboxylic acid salt having an ether-bonding in molecule, which is represented by the general formula

MOOCR'OR''COOM'

where R' and R'' are alkylene groups having a summed up carbon number of not more than 10, which can be identical to or different from each other, and M and M' are Na, K or Mg, which can be identical to different from each other;

(d) water and at least one alkaline substance consisting of NaOH, KOH, Na_2CO_3, K_2CO_3, $NaHCO_3$ and $KHCO_3$; and

(e) at least one hydroxycarboxylic acid salt represented by the formula

R'''COOM

wherein R''' is a hydroxyalkyl group having a carbon number of not more than 5, and M is Na, K or Mg, wherein the molar ratio of γ-butyrolactone to the 1,1,1-trifluoro-2-halogenated ethane is 0.5 to 20, wherein further the molar ratio of any one of the carboxylic acid salt, the dicarboxylic acid salt, the dicarboxylic acid salt having an ether-bonding in molecule, the alkaline substance and the hydrocarboxylic acid salt to 1,1,1-trifluoro-2-halogenated ethane is 0.25 to 10, wherein also the molar ratio of water to 1,1,1-trifluoro-2-halogenated ethane is 0.5 to 15, and wherein the reaction temperature is 130° to 250° C., the 1,1,1-trifluoro-2-halogenated ethane being selected from the group consisting of 1,1,1-trifluoro-2-bromoethane and 1,1,1-trifluoro-2-chloroethane, in the presence of at least the self-generated pressure corresponding to the reaction temperature.

4,489,212

PROCESS FOR PREPARING ALLYL- AND 2-CHLOROPROPYL- OR PROPENYLARENE COMPOUNDS

Thomas H. Johnson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 25, 1983, Ser. No. 545,303

Int. Cl.³ C07C *41/18, 1/26*

U.S. Cl. 568—628 **9 Claims**

1. A process for reacting an arene with allyl chloride to produce allylarene and 2-chloro- or propenylarene which process comprises contacting said arene with allyl chloride at a temperature ranging from about 10° C. to about 400° C. in the presence of a catalyst which comprises pentavalent tantalum, halogen, oxygen and a metal oxide substrate wherein at least one valence of tantalum is bound to oxygen which is bound to the substrate, at least one valence of tantalum is bound to halogen and the remaining tantalum valences are bound to halogen and/or oxygen which may or may not be bound to the substrate.

4,489,213

ALUMINA CATALYST FOR ALKYLATING AROMATICS WITH OLEFINS

Stephen M. Kovach, Ashland, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 180,963, Aug. 25, 1980, Pat. No. 4,285,835, which is a continuation-in-part of Ser. No. 55,221, Jul. 5, 1979, abandoned, which is a division of Ser. No. 860,503, Dec. 14, 1977, abandoned. This application Jun. 29, 1981, Ser. No. 278,248

Int. Cl.³ C07C *2/68*

U.S. Cl. 585—467 **10 Claims**

1. A method for enhancing formation of para-isomers comprising alkylating an aromatic compound having at least one replaceable hydrogen with an olefinic hydrocarbon having between 2 and 12 carbon atoms per molecule comprising con-

tacting said aromatic compound with said olefin in the presence of a catalytic amount of a catalyst comprising:

(a) between about 0.1 and about 4% by weight of the oxide of a metal selected from the group consisting of tin, lead, mixtures of tin and lead and mixtures of tin, lead and manganese and;

(b) between about 0.5 and 15% by weight of boria, both impregnated on an alumina support.

4,489,214

PRODUCTION OF ORTHO-SUPPRESSED DIALKYL BENZENES

James R. Butler; Debra L. Kendall; Cleve H. Forward; James M. Watson, and Gary D. Branum, all of Big Spring, Tex., assignors to Cosden Technology, Inc., Dallas, Tex.

Filed Mar. 1, 1982, Ser. No. 353,448

Int. Cl.³ C07C *2/68*

U.S. Cl. 585—467 **13 Claims**

1. A process for producing dialkyl substituted benzene isomer mixes having less than a thermodynamic equilibrium amount of ortho isomer comprising contacting toluene or ethylbenzene with an alkylating agent under alkylation conditions which do not include steam cofeed in the presence of a crystalline silica polymorph silicalite catalyst and recovering the produced dialkyl benzene isomer mix having an ortho isomer content which is less than the thermodynamic equilibrium amount thereof.

4,489,215

METHANE CONVERSION

Howard P. Withers, Pottstown, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 16, 1984, Ser. No. 600,669

Int. Cl.³ C07C *2/00*

U.S. Cl. 585—500 **28 Claims**

26. A method for converting methane to higher hydrocarbon products which comprises contacting at a temperature within the range of about 500° to 1000° C. a gas comprising methane and a solid comprising a reducible oxide of Ru and at least one member of the group consisting of alkali metals and compounds thereof.

4,489,216

HYDROCARBON ISOMERIZATION

Paul H. Lewis, Groves, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jan. 25, 1982, Ser. No. 342,546

Int. Cl.³ C07C *5/24*

U.S. Cl. 585—739 **5 Claims**

1. The method of isomerizing an isomerizable hydrocarbon charge which comprises

passing an isomerizable hydrocarbon charge at isomerization conditions into contact with as isomerization catalyst, a hydrogen ..ordenite catalyst, having a silica-to-alumina mole ratio of 10–20:1, loaded with a metal of the platinim-palladium group, said catalyst containing activated isomerization sites formed by calcining at 1200° F.–1500° F. after loading, thereby forming product isomate; and

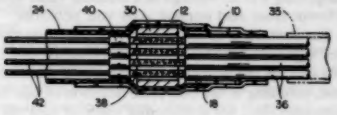
recovering said product isomate.

4,489,217

SHIELD CONNECTION DEVICE

Henry E. Klopfer, Sunnyvale, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Apr. 7, 1982, Ser. No. 366,268
Int. Cl.³ H02G 15/18
U.S. Cl. 174—35 C 9 Claims



1. A flexible shield connection device, comprising:

a first hollow heat-recoverable member having open ends;

a second hollow deformable heat-recoverable member having open ends and one end being within the first member; and

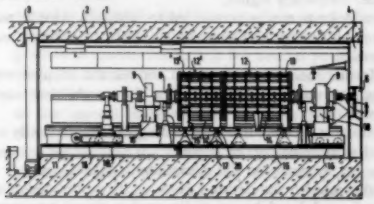
flexible means for shielding electromagnetic interference having one end between the first member and the end of the second member within the first member, the flexible means defining a gross shielding means and the opposite end of the second member defining an inside guide means, the flexible means including a quantity of fusible material on that portion of the means outside the second member, thereby as heat is applied to the device the first member recovers deforming the flexible means and second member and trapping the flexible means between the first and second members forming a flexible device.

4,489,218

DEVICE FOR PROTECTING METAL OBJECTS SITUATED IN THE ENVIRONMENT OF AN INTENSE MAGNETIC FIELD DEVELOPED BY AN ALTERNATOR ROTOR WITHOUT A STATOR

Jean Delassus, Montmorency; Michel Gey, Houilles; Jean-Claude Comensoli, Gonesse, and Paul Pouger, Aulnay sous Bois, all of France, assignors to Alsthom-Atlantique, Paris, France

Filed Aug. 12, 1982, Ser. No. 407,413
Claims priority, application France, Aug. 25, 1981, 81 16203
Int. Cl.³ H05K 9/00
U.S. Cl. 174—35 R 5 Claims



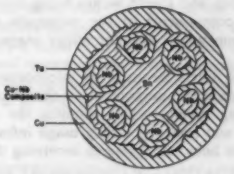
1. A device for protecting metal objects situated in the environment of an intense magnetic field as developed by an alternator rotor with an excitation current passing therethrough during testing without a stator, the device comprising a multi part metal covering for surrounding the rotor, said covering comprising at least one cylindrical metal cage forming a cylindrical grid with openings therein, each said at least one cage comprising a lower half cage supported on a base and an upper half cage placed on the lower half cage, the half cages meeting along a horizontal joint plane, and each half cage comprising horizontal electrically conductive bars extending parallel to the rotor axis and mechanically and electrically joined to electrically conductive semi-circular rib members, said rib members including hollow end rib members at respective ends of said at least one cage, said at least one cage being longer than the portion of the rotor which produces a magnetic field, and said horizontal conductor bars being tubes, and means for circulating cooling water through said tubes, the wherein said hollow end rib members constitute inlet and outlet end manifolds for the cooling water.

4,489,219

A-15 SUPERCONDUCTING COMPOSITE WIRES AND A METHOD FOR MAKING

Masaki Suenaga, Bellport; Carl J. Klamut, East Patchogue, and Thomas S. Luhman, Westhampton Beach, all of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 394,080, Jul. 1, 1982, abandoned, which is a continuation of Ser. No. 178,655, Aug. 15, 1980, abandoned. This application Jun. 8, 1983, Ser. No. 500,806
Int. Cl.³ H01B 12/00; H01L 39/24
U.S. Cl. 174—128 S 13 Claims



1. A structure comprising:

(a) a cable having a plurality of copper niobium composite wires bundled about a tin-alloy core;

(b) a layer of tantalum foil wrapped about said cable; and

(c) an outer layer of copper wrapped about said tantalum layer.

4. A process for making a structure comprising the steps of:

(a) providing a tin-alloy core; and,

(b) wrapping a strip of copper, the copper containing a plurality of longitudinal filaments of niobium, about said core so as to form an exterior layer.

4,489,220

TEST SET

Stewart W. Oliver, Venice, Calif., assignor to International Teldata II Corp., Los Angeles, Calif.

Filed Jun. 8, 1983, Ser. No. 502,227
Int. Cl.³ H04M 11/00
U.S. Cl. 179—2 AM 26 Claims

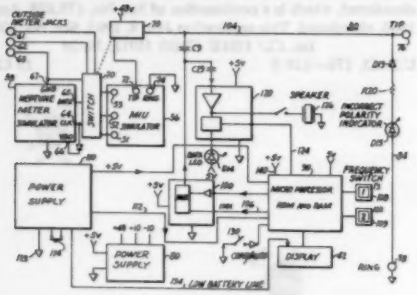
1. In an automatic utility meter reading system having component parts which monitor utility usage information, send interrogation signals over the telephone lines, send the monitored utility usage information over telephone lines responsive to the receiving of interrogation signals over the telephone lines, and receive the utility usage information from the telephone lines, a test apparatus for testing component parts of the automatic utility meter reading system comprising:

a first means for simulating the operation of the components of the automatic utility meter reading system which monitor the utility usage information;

a second means for simulating the operation of the components of the automatic utility meter reading system which send the interrogation signals over the telephone lines;

a third means for simulating the operation of the components of the automatic utility meter reading system which send the monitored utility usage information over the telephone lines responsive to receiving the interrogation signal; and,

a fourth means for simulating the operation of the components of the automatic utility meter reading system which receive the utility usage information;



the first, second, and fourth means being interconnectable to test the operation of the components of the automatic utility meter reading system which send the utility usage information over the telephone lines responsive to receiving the interrogation signals;

the second, third, and fourth means being interconnectable to test the components of the automatic utility meter reading system which monitor utility usage information; and,

the second, and fourth means being interconnectable to test the combination of components of the automatic utility meter reading system which monitor the utility usage information and send the utility usage information over the telephone lines responsive to receiving the interrogation signals.

4,489,221

TELEPHONE LINE/SUBSCRIBER EQUIPMENT DISCONNECT APPARATUS

Herbert B. Walker, and Richard S. Hoppough, both of Greensboro, N.C., assignors to Micro Computer Systems, Inc., Greensboro, N.C.

Filed Aug. 23, 1982, Ser. No. 410,290
Int. Cl.³ H04M *3/12*; H04Q *1/20*
U.S. Cl. 179—19 **6 Claims**

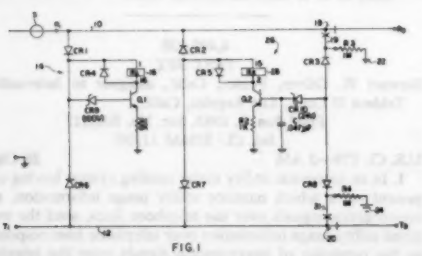


FIG. 1

1. An improved telephone subscriber equipment disconnect apparatus for use in remotely disconnecting and connecting said subscriber equipment and a central telephone station which in a normal condition are connected by tip and ring lines carrying a normal potential of −48 volts D.C., said apparatus comprising:

(a) means at said central station for generating a disconnect signal on at least one of said tip and ring lines, said signal comprising a D.C. voltage of a selected value substantially different from said normal −48 volt potential;

(b) a first switching means directly resonsive to said disconnect signal for substantially immediately disconnecting both said tip and said ring lines from said subscriber equipment, resulting in the complete isolation of said subscriber equipment, and for connecting each of said tip and ring lines to ground through separate prescribed resistances selected to be indicative of satisfactory line switching; and

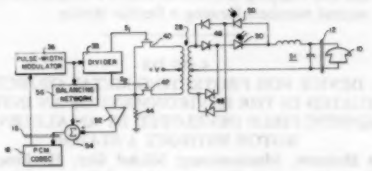
(c) second switching means directly responsive to removal of said disconnect signal and resumption of said normal voltage on said lines for again and immediately re-establishing connection of said subscriber equipment.

4,489,222

TELEPHONE LINE INTERFACE

Bruce B. Lusignan, and Hamid Najafi, both of Palo Alto, Calif., assignors to The Board of Trustees of the Leland Stanford, Junior University, Palo Alto, Calif.

Filed Sep. 13, 1982, Ser. No. 417,638
Int. Cl.³ H03K *7/08*; H04B *3/20*
U.S. Cl. 177—170.2 **12 Claims**



1. A telephone line interface for receiving and transmitting audio analog signals between a switch and a subscriber telephone comprising

a two wire terminal for receiving and for transmitting an audio frequency signal,

first modulator means connected to said two wire terminal for modulating a carrier signal with a received audio signal,

transformer means including first and second coupled windings for magnetically coupling the modulated carrier signal,

demodulator means for demodulating the magnetically coupled modulated carrier signal,

means for transmitting the demodulated signal, and

hybrid means for simulating a pulse width modulated carrier signal modulated by an audio analog signal transmitted from said switch, said hybrid means removing said pulse width modulated signal as an echo from a signal transmitted from said subscriber telephone to said switch.

4,489,223

BATTERY JUMP CABLE APPARATUS

William E. Puckett, Oklahoma City, and Ladd M. Adams, Norman, both of Okla., assignors to Smart Start Corporation, Oklahoma City, Okla.

Filed Jul. 28, 1982, Ser. No. 402,828
Int. Cl.³ H02G *11/02*; B65H *75/42*; H02J *7/00*; G08B *21/00*
U.S. Cl. 191—12.2 R **14 Claims**

1. An improved battery jump cable apparatus for supplying electrical energy from the battery of a service vehicle to the battery of a second vehicle, comprising:

a pair of jumper cables each having a clamp on a free end

thereof for connecting the cables to the battery of the second vehicle;

a casing mounted on the service vehicle;

a reel disposed within the casing, the reel adapted for alternatively paying out and retrieving the jumper cables, the reel comprising:

a frame;

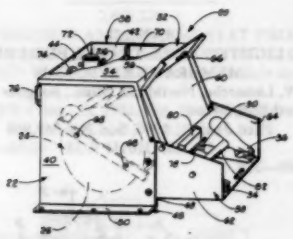
a spool having a spool axis about which the jumper cables can be wrapped on the spool, wherein the spool is mounted on the frame for rotation in opposed first and second directions about the spool axis, and wherein portions of each of said cables near one end thereof opposite said free ends are secured to the spool for wrapping the cable on the spool via rotation of the spool in the second direction;

means for urging the spool to rotate in the second direction;

a ratchet lock mounted on the frame for pivotation about an axis spaced from the spool axis and substantially parallel thereto, the ratchet lock having a protruding nose portion extending generally toward the spool axis in a neutral position of the ratchet lock;

means for urging the ratchet lock toward the neutral position at such times that the ratchet lock is pivoted to either side of the neutral position;

a ratchet wheel secured to the spool coaxially with the spool and in lateral alignment with the ratchet lock, the ratchet wheel having at least one first segment having a



plurality of teeth formed thereon along an arc of a circle centered on the spool axis and intersected by the nose portion of the ratchet lock in the neutral position of the ratchet lock, and the ratchet wheel having at least one second segment of a radius insufficient for engagement of the second segment with the nose portion of the ratchet lock; and

means for limiting the rotation of the spool so as to align the nose portion of the ratchet lock with portions of a second segment of the ratchet wheel at a limit of rotation of the spool in the first direction defined by the cables being fully paid out from said reel;

a solenoid mounted on the casing, the solenoid having a set of normally open contacts and a coil energizable for closing said contacts, one side of said contacts electrically connected to one pole of the service battery;

first connecting means for electrically connecting the other side of said solenoid contacts to one of said jumper cables at said reel;

second connecting means for electrically connecting the other pole of the service battery to the other of said jumper cables at said reel;

receiver means disposed within said casing for energizing the coil of the solenoid in response to reception by the receiver means of a coded electromagnetic signal at a preselected frequency; and

a transmitter operable to transmit said coded signal of said preselected frequency.

4,489,224

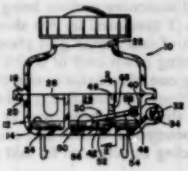
FLUID LEVEL INDICATOR

John E. Steer, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Apr. 1, 1983, Ser. No. 481,516

Int. Cl.³ H01H *35/18*

U.S. Cl. 200—84 C **10 Claims**



1. A fluid level indicator for a reservoir containing fluid, the indicator including a magnet which cooperates with a reed switch or the like to generate a signal when the fluid level in the reservoir is below a predetermined level and a carrier assembly engageable with the magnet to control movement of the latter, characterized in that said carrier assembly comprises a first part supporting said magnet thereto and a second part movable in response to the level of fluid in the reservoir to move said magnet from a rest position to an actuated position, said second part defining a weight which is greater than a weight for said first part and said magnet when said carrier assembly is out of the fluid, said first part and said magnet combined weight being greater than said second part weight when said carrier assembly is in the fluid, said carrier assembly comprising a solid plastic-like material having a density which is less dense than the density of said magnet whereby said second part will move said first part as the fluid level approaches or reaches the predetermined level, and said carrier assembly density is equal to or slightly greater than the density of the fluid in said reservoir, whereby said carrier assembly and said magnet remain freely immersed in the fluid when the level of the latter is at or near the top of the reservoir.

4,489,225

ELECTROMAGNETIC CONTACTOR

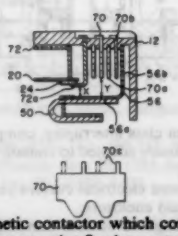
Shigeru Masuda; Hiroyuki Okado, both of Nagoya, and Teijiro Mori, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 3, 1982, Ser. No. 404,923

Claims priority, application Japan, Aug. 13, 1981, 56-120449[U]; Aug. 20, 1981, 56-123369[U]

Int. Cl.³ H01H *33/08, 33/10*

U.S. Cl. 200—144 R **15 Claims**



1. An electromagnetic contactor which comprises:

(a) a stationary contact point fixed to a stationary contact;

(b) a movable contact point fixed to a movable contact, said movable contact point being positioned to associate with said stationary contact point for switching operations and being movable in a contact direction toward and away from said stationary contact;

(c) an arc box for arc extinction, one face of said arc box having a plurality of parallel, regularly spaced slits therein extending in a slit-extending direction perpendicular to said contact direction;

(d) a grid composed of a plurality of parallel planar grid plates disposed in said arc box, said plurality of planar grid plates extending toward said stationary contact in said contact direction and extending perpendicularly thereto in said slit-extending direction, the ends of said grid plates closest to said stationary contact being spaced therefrom by a distance Y measured by the shortest unobstructed distance, each of said planar grid plates terminating in a plurality of fitting pawls each of which extends through a corresponding one of said slits in said one face of said arc box, the portions of said fitting pawls which extend through said slits being bent over in a pawl-extending direction perpendicular to both said contact direction and said slit-extending direction to fix said grid plates to said arc box;

(e) a commutation plate in electrical contact with said movable contact and with said arc box to commutate arc produced between said stationary contact and said movable contact, the end of said commutation plate closet to said stationary contact being spaced therefrom by a distance X measured by the shortest unobstructed distance, the distance X being smaller than or equal to the distance Y; and

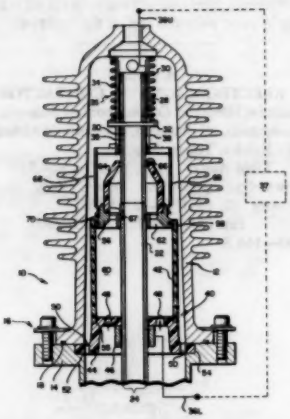
(f) an arc runner in electrical contact with said stationary contact and with said arc box.

4,489,226

DISTRIBUTION CLASS PUFFER INTERRUPTER

Nils V. Holmgren, Greendale, and Donald R. Martin, Racine, both of Wis., assignors to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Sep. 3, 1982, Ser. No. 414,607
Int. Cl.³ H01H *33/88*
U.S. Cl. 200—148 A **15 Claims**



1. A distribution class interrupter, comprising:

a. an outer enclosure adapted to contain an arc extinguishing fluid therein;

b. a first elongated electrical current carrying member carried within said enclosure;

c. a second elongated current carrying member which is disposed end-to-end with said first member and which is movable within said enclosure between a closed position where it is in electrical contact with said first member and an opened position where it is spaced from said first member, said first member and said second member defining a gap when said second member is in its opened position such that an electrical arc is formed across said gap as said first member is separated from said second member, at least one of said first and second current carrying members defining an internal passageway in fluid communication with said gap and the interior of said enclosure for directing ioized fluid thereformed, said second member being adapted to be operated by a prime mover to stroke said second member between its opened position and its closed position;

d. piston means, carried by said second member, for supplying pressurized fluid into said gap as said second member is moved into its opened position, said pistion means moving between a raised position and a lowered position in response to said prime mover;

e. base means, carried by said outer enclosure, for housing said piston means, said piston means and said base means defining a variable volume chamber whose interior is pressurized when said prime mover strokes said second member for its closed position to its opened position; and

f. insulated plenum means, carried by said piston means and disposed around the contacting ends of said first member and said second member, for confining the fluid supplied by said piston means from said variable volume chamber in the vicinity of said gap until said arc is extinguished, said plenum means having a length at least equal to the length of the arc formed between said first and second members,

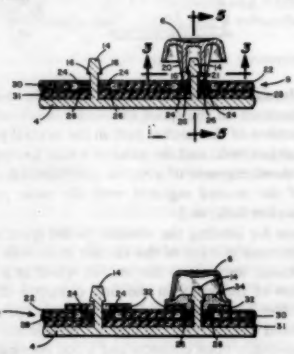
whereby the interior of said outer enclosure adjacent said gap is shielded from the ionized fluid thereformed.

4,489,227

BACK LIGHTED, FULL TRAVEL PUSH BUTTON MEMBRANE KEYBOARD

Fredrick W. Lamarche, Northfield, Minn., assignor to Sheldahl, Inc., Northfield, Minn.

Filed Jan. 11, 1984, Ser. No. 569,969
Int. Cl.³ H01H *9/18*
U.S. Cl. 200—314 **12 Claims**



1. An electrical switch array comprising:

(a) a support plane having a plurality of integrally formed projections extending from at least one surface thereof;

(b) resilient support means overlying the surfaces of said support plane from which said projections extend and through which said projections pass;

(c) membrane switch means overlying said resilient support means and having at least two flexible dielectric planar sheets, each separated from one another via an electrically insulative spacer, and wherein each of said dielectric sheets includes a plurality of patterned electrical contacts, said membrane switch means further including a plurality

of apertures formed therethrough in the regions of said electrical contacts for mounting over said projections; and

(d) key-cap means mounted over each of said projections and slidably operative relative thereto for depressibly bringing lower lying ones of the contacts on at least one of said flexible membrane sheets in the region of each depressed key-cap into electrical contact with the contacts on at least one other of said flexible sheets.

6. An electrical switch array comprising in combination:

(a) a light transparent support plane having a plurality of integrally formed projections extending from at least one surface thereof;

(b) a light source coupled to said support plane for transmitting light through the tops of said projections;

(c) a resilient support pad overlying each of said surfaces from which said projections extend and through which said projections pass;

(d) first and second flexible switch layers, each having a plurality of patterned electrically conductive switch contacts deposited thereon in the region of a plurality of apertures formed therethrough and corresponding to the location of said support plane projections;

(e) a resilient support layer mounted between said first and second switch layers having a plurality of apertures formed therethrough relative to said support plane projections; and

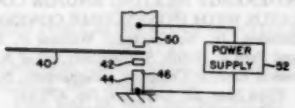
(f) a plurality of key-caps nonrotatively contained and slidably mounted to said support plane projections, whereby upon depressing each of said key-caps, said first and second switch layers may be brought into electrical contact in a region localized to said key-cap.

4,489,228

WELDING METHOD AND THERMOSTAT PRODUCED

Robert M. Wells, 4371 Ira Rd., Akron, Ohio 44313, and Alton R. Wells, 4573 W. Trade Winds Ave., Lauderdale-by-the-Sea, Fla. 33308

Filed Sep. 20, 1982, Ser. No. 419,774
Int. Cl.³ B23K *11/16*
U.S. Cl. 219—56.22 4 Claims



1. A method of welding electrical contacts onto a conductive body by use of metal contacts having a pure metal surface thereon including the steps of engaging one surface of a contact with the conductive body, and passing a welding current through a pair of spaced areas of the pure metal surface of the contact and the conductive body to weld the contact to the conductive body, the weld action leaving a center area on the pure metal surface of the contact between the said spaced areas which centerarea has an unoxidized, pure metal surface.

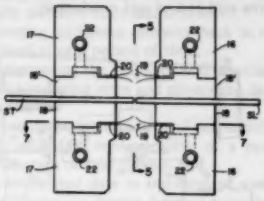
4,489,229

FLASH BUTT WELDER FOR JOINING FLAT STRIP ENDS

Walter F. Haessly, Salem, Ohio, assignor to The Taylor-Winfield Corporation, Warren, Ohio

Filed Sep. 20, 1982, Ser. No. 420,268
Int. Cl.³ B23K *11/04*
U.S. Cl. 219—100 10 Claims

1. A flash butt welder for joining flat strip ends, including a pair of welding electrodes and a clamp die assembly comprising a pair of clamp dies and clamp die inserts having confronting faces, separated by a horizontal space, the improvement for improving the quality of flash butt welds and for considerably reducing upset current requirements comprising the provision, in said assembly, of gas exhaust ports fed by a combustible gas source for applying a protective gas flame layer above and below the strip ends, said gas flame being ignited by the flashing action of the welding operation, said horizontal space between said dies and inserts being unobstructed in a vertical direction and said electrodes being unenclosed to enable rapid removal of weld flash particles clogging said ports.



10. A method of flash butt welding with a flash butt welder comprising applying a combustible gas stream to the butt weld during the welding operation from a plurality of horizontally spaced exhaust ports above and below the strip ends during welding and igniting said gas stream by flashing action during the welding process.

4,489,230

MANUFACTURING METHOD FOR A RESISTANCE ELEMENT

Yutaka Yamamoto, Nango, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 430,602
Claims priority, application Japan, Feb. 15, 1982, 57-21270
Int. Cl.³ B23K *27/00*
U.S. Cl. 219—121 LM 10 Claims

1. A manufacturing method for a resistance element, comprising the steps of;

forming on the surface of an electrically insulating base layer including an organic substance to be carbonized by the irradiation of a laser beam a laser beam transmitting film with a electrical-insulating property and with the property of not being carbonized by the irradiation of said laser beam;

irradiating the laser beam on said base layer through said film from one side thereof; and

forming a resistance layer by carbonizing the irradiated portion of said base layer.

4,489,231

METHOD FOR PREPARING ELECTRICAL CONDUCTOR

Edwin J. Luetzow, Farmington, Minn., assignor to TelTec Inc., Farmington, Minn.

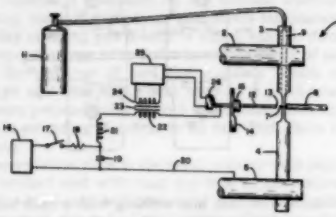
Continuation-in-part of Ser. No. 188,717, Sep. 19, 1980, abandoned. This application Sep. 16, 1982, Ser. No. 419,037
Int. Cl.³ B23K *9/00*
U.S. Cl. 219—137 R 2 Claims

1. Process for preparing an end of a multi-strand conductor with a welding ball for attachment to a terminal member, said process comprising:

a. positioning an end portion of a multi-strand conductor adjacent to and touching a horizontal tungsten electrode of an electrode fixture;

b. gripping said portion with opposing clamp members including opposing aperture surfaces for gripping side surfaces of said conductor adjacent to said end in a substantially horizontal plane and substantially parallel to said electrode;

c. flowing of a CO^2 inert gas down a bore of an upper of said opposing clamp members, said bore terminating where said conductor is gripped, and said inert gas flowing at said termination of said bore and at said gripped conductor across said end of said conductor;



d. moving said horizontal electrode away from said end of said conductor forming a gap therebetween;

e. striking an arc across said gap and creating a high conductance path of ionized plasma through said inert gas; and,

f. passing current of at least a value to fuse said multi-strands into a coalescent weld ball at said end of said conductor having a diameter in the range of 1-1.5 the diameter of said conductor.

4,489,232

APPARATUS FOR HEATING A MIXED GAS ON AN INTERNAL COMBUSTION ENGINE

Shigetaka Wada, Kuwana, and Toshio Yamada, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Japan

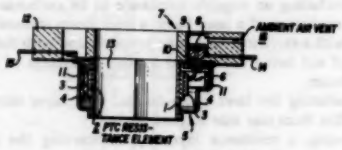
Filed Oct. 9, 1981, Ser. No. 310,327

Claims priority, application Japan, Oct. 13, 1980, 56-144787[U]

The portion of the term of this patent subsequent to May 4, 1999, has been disclaimed.

Int. Cl.³ F02M *31/12*; H05B *3/12*

U.S. Cl. 219—206 **3 Claims**



1. An apparatus for heating a fuel mixture of an internal combustion engine, which comprises a plurality of ceramic heating elements having a positive temperature coefficient of electric resistance, along with a resilient member, which are inserted between a double walled structure comprising a metal inner cylinder and a metal outer cylinder, with said resilient member urging said ceramic heating elements into contact with said inner metal cylinder, said inner and outer metal cylinders defining a cylindrical heating body adapted to form a passageway between a fuel supply and an internal combustion engine, the cylindrical heating body being sealed in a gas-tight manner by sealing means between the metal inner cylinder and the metal outer cylinder, thereby creating a sealed chamber, and an insulator in contacting engagement with said cylindrical heating body, the insulator having a conductive means and an air hole extending therethrough, and means electrically connecting said conductive means to said ceramic heating elements and communicating the interior of said sealed chamber with an external air supply through said air hole.

4,489,233

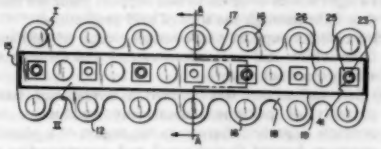
HAIR ROLLER HEATING UNIT

Dov Z. Glucksman, 26 Beacon St., Apt. 9F, Burlington, Mass. 01803

Filed Dec. 30, 1983, Ser. No. 567,239

Int. Cl.³ A45D *4/12*; H05B *3/02*

U.S. Cl. 219—242 **10 Claims**



1. A heater unit for a hair roller heating set composed of two heat-conductive sheet-metal components carrying at least three rows of upstanding hollow heating posts and enclosing between them electrical resistance heater means, the heater unit comprising: a main plate of generally rectangular configuration containing two lateral, parallel rows of said heating posts along the long edges of the rectangle, and being centrally recessed in the shape of a substantially rectangular trough of a depth commensurate with the thickness of said electrical heater means, said trough extending between the two rows of said lateral posts over substantially the entire length of said main plate; a top plate of rectangular configuration commensurate with the dimensions of said trough in said main plate, provided with at least one row of said hollow heating posts and rigidly attached to said main plate covering said trough; an electrical resistance heater in the form of an electrically insulated wire positioned along the four sides of said rectangle.

4,489,234

RADIANT-ENERGY HEATING AND/OR COOKING APPARATUS WITH HONEYCOMB COVERPLATE

John D. Harnden, Jr., Schenectady; William P. Kornrumpf, Albany, and Fred F. Holub, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 25, 1983, Ser. No. 478,827

Int. Cl.³ B32B *3/12*; H05B *3/40*

U.S. Cl. 219—347 **12 Claims**

1. Apparatus for at least one of radiant-energy heating and radiant-energy cooking, comprising:

heating means for producing at least infrared-wavelength radiation;

means for directing substantially all of at least said infrared-wavelength radiation from said heating means toward a surface;

a coverplate comprised of: a first member substantially defining said surface; a second member spaced from said first member and between said first member and said heating

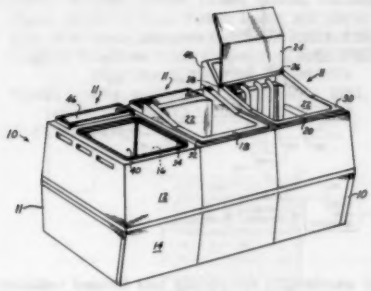
means; and a honeycomb structure disposed between, and substantially joined to, said first and second members; said coverplate having substantial transmission of said at least infrared-wavelength radiation therethrough to said surface.

4,489,235

HYDROCOLLOID CONDITIONER APPARATUS

Don D. Porteous, 8894 Regent St., Los Angeles, Calif. 90034

Filed Feb. 13, 1984, Ser. No. 579,478
Int. Cl.³ F27D *11/00*
U.S. Cl. 219—437 **19 Claims**



1. A hydrocolloid conditioner comprising a frame, a bath tank separably supported by said frame for containing water heated to a pre-determined temperature useful in the conditioning of hydrocolloid material, heating means comprising a power supply and a heating element disposed within the bath, and a microprocessor interfaced with a triac control circuit for turning on and off said heating means responsive to command from said microprocessor.

4,489,236

METHOD FOR CALIBRATING SCINTILLATION CRYSTAL

Stephen J. Outhwaite, Clarks Summit, Pa., assignor to Fairchild Weston Systems, Inc., Archbald, Pa.

Filed Nov. 18, 1981, Ser. No. 322,501
Int. Cl.³ G01T *1/202*; G01D *18/00*
U.S. Cl. 250—252.1 **13 Claims**

7. In a thickness gauge of the radiation absorption type including means for generating a beam of penetrating electromagnetic radiation, a scintillation crystal sensitive to said electromagnetic radiation, means for detecting and measuring the output of said scintillation crystal and for generating data representative of said scintillation crystal output, and means for storing said data and for controlling the operation of said gauge, a method of calibrating the scintillation crystal, comprising the steps of:

irradiating said scintillation crystal at a first intensity level with said beam of electromagnetic radiation;

abruptly changing said beam intensity to a second level substantially different than said first level;

abruptly changing said beam intensity back to substantially said first level after a period of time;

periodically measuring the output of said scintillation crystal during said irradiating steps and generating data representative thereof;

correlating said data representative of said scintillation crystal output with data representative of a predetermined response function of said crystal; and

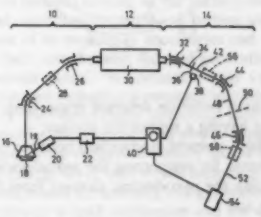
storing said correlated data in the form of a table of time dependent correction factors for said scintillation crystal whereby the effects of hysteresis and afterglow of said crystal can be compensated for.

4,489,237

METHOD OF BROAD BAND MASS SPECTROMETRY AND APPARATUS THEREFOR

Albert E. Litherland, Toronto; Linas R. Kilius, and Emil L. Hallin, both of Downsview, all of Canada, assignors to The Innovations Foundation of the University of Toronto, Toronto, Canada

Filed Feb. 11, 1982, Ser. No. 348,103
Int. Cl.³ B01D *59/44*; H01J *49/40*
U.S. Cl. 250—287 **12 Claims**



1. A high energy broad band charge changing mass spectrometer comprising:

(a) means for producing a continuous quantity of negatively charged atomic ions of mass band and abundance to be determined, which quantity will also include unwanted molecular ions,

(b) at least one electrostatic device which is charge sensitive in accordance with the ratio E/q where E is the ion energy and q is the ion charge, whereby the device will select ions of wanted ratio and reject ions and molecules of unwanted ratio, the device receiving the said quantity of negative ions and unwanted molecules from the ion producing means, selecting from the said quantity the ions of wanted ratio and rejecting ions and molecules of unwanted ratio,

(c) an accelerating, molecular destruction and charge changing device receiving the selected ions and remaining unwanted ions and molecules from the said electrostatic device, accelerating the received ions and molecules to result in higher energy ions of energy sufficient to permit the passage of these higher energy ions through the accelerating and charge changing device with molecular destruction and change of charge to result in a beam of multiply charged positive ions including molecular fragments, and

(d) a continuous-operation electrostatic time-of-flight mass analysis system that is isochronous for ions of the same

mass, the system comprising a start detector and a cooperating stop detector through which the received beam passes for operation of the system,

(e) the start detector comprising a thin foil through which the received beam passes resulting in an output beam therefrom of ions of altered charge state and consequent changed E/q ratios,

(f) the mass analysis system comprising at least one system electrostatic device which is charge sensitive in accordance with the said ratio E/q for selection of positive ions of wanted ratio and rejection of ions of unwanted ratio, the device receiving the beam passing through the system, selecting the positive ions of wanted ratio and rejecting the ions of unwanted ratio.

4,489,238

INFRARED RADIATION DETECTOR

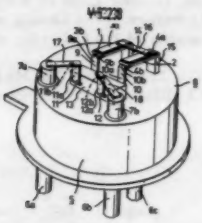
Geoffrey Baker, Southampton, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 6, 1982, Ser. No. 395,158

Claims priority, application United Kingdom, Jul. 17, 1981, 8122186

Int. Cl.³ G01J 1/00

U.S. Cl. 250—338 **19 Claims**



1. An infrared radiation detector comprising:

a substrate having a supporting surface;

a pyroelectric element sandwiched between two electrodes;

support means for supporting the pyroelectric element and for spacing the pyroelectric element from the supporting surface; and

a circuit arrangement having at least one circuit element electrically connected to one of the electrodes;

characterized in that:

the circuit arrangement is encapsulated in a package which has protruding conductive leads electrically connected to the circuit arrangement;

the circuit arrangement package is disposed on the supporting surface; and

the support means comprises a first protruding conductive lead.

4,489,239

PORTABLE REMOTE LASER SENSOR FOR METHANE LEAK DETECTION

William B. Grant, Altadena, and E. David Hinkley, Jr., Glendora, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 24, 1982, Ser. No. 423,016

Int. Cl.³ G01J 1/00

U.S. Cl. 250—339 **21 Claims**

1. A portable, low wattage system for remotely detecting methane gas concentrations in the atmosphere from radiation reflected from a topographical target, said radiation including thermal and solar-type background noise, including methane-related laser wavelengths to be analyzed, said system comprising:

means for generating a first laser beam at a first wavelength coincident with a natural absorption line of methane gas;

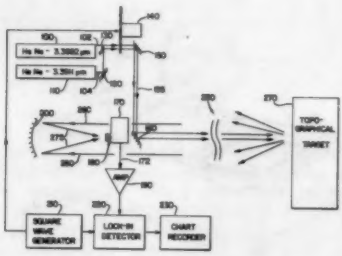
means for generating a second laser beam at a second wavelength which is not a strong absorption line of methane gas;

means for successively interrupting said first and second laser beams;

means for directing said first and second laser beams at a topographical target;

collecting means for focusing a portion of said reflected laser radiation;

narrowband optical filter means centered near said first and



second wavelengths for passing said focused radiation, including the wavelengths to be analyzed and for effectively reducing said thermal and solar-type background noise;

optical detector means for detecting the intensity of incident laser radiation and generating a detector signal representative of such intensity;

signal processing means synchronized to the operation of said means for interrupting said laser beams for performing processing of the data from said optical detector to effectively cancel out the background noise while providing an output signal indicative of the relative intensity of said radiation at said first wavelength.

4,489,240

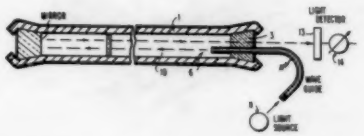
RADIOCHROMIC LEUKO DYE REAL TIME DOSIMETER, ONE WAY OPTICAL WAVEGUIDE

Stanley Kronenberg, Hollow Rd., Skillman, N.J. 08558; William L. McLaughlin, 3901 Albemeale St. NW., Washington, D.C. 20016, and Carl R. Siebentritt, 1045 Brook Valley La., McLean, Va. 22101

Filed Nov. 15, 1982, Ser. No. 441,718

Int. Cl.³ G01T 1/00

U.S. Cl. 250—474.1 **9 Claims**



1. A radiochromic leuko dye dosimeter comprising a tube, a reflective member closing one end of said tube, a transparent member closing the other end of said tube, a solution of a radiochromic dye which changes color upon exposure to ionizing radiation contained within said tube, said solution of radiochromic dye having an index of refraction greater than the refracfive index of said tube wall to thereby form a waveguide, a transversely extending partition mounted in said tube and dividing the tube into a pair of chambers, one chamber being disposed between the reflective member and one side of said partition, and the other chamber being disposed between

the transparent member and the opposite side of said partition, said solution of radiochromic dye being contained in said one chamber, and a solvent invulnerable to radiation being contained in the other chamber, light means for directing light rays into the transparent end of said tube, said light rays being reflected by said reflective member and exiting through said transparent end, and instrumentation means for detecting the exiting light rays and measuring and indicating the intensity of the exiting light as a function of the nuclear radiation dose being delivered in the vicinity of the tube.

4,489,241

EXPOSURE METHOD WITH ELECTRON BEAM EXPOSURE APPARATUS

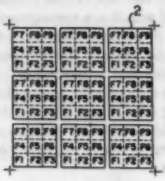
Tadahito Matsuda, Iruma; Tsuneo Okubo, Hachioji; Susumu Ozasa, Kashiwa; Norio Saitou, Iruma, and Haruo Yoda, Tokyo, all of Japan, assignors to Hitachi, Ltd. and Nippon Telegraph & Telephone Public Corporation, both of Tokyo, Japan

Filed Jun. 9, 1982, Ser. No. 386,579

Claims priority, application Japan, Jun. 10, 1981, 56-88185

Int. Cl.³ H01J *37/317*

U.S. Cl. 250—491.1 **13 Claims**



1. An exposure method with an electron beam exposure apparatus comprising steps of:

dividing in advance a substrate having thereon a number of chips into blocks each having a plurality of chips;

providing marks on each of said blocks but not on each of said chips;

detecting the positions of the marks provided on said blocks upon exposing a desired block; and

correcting writing exposure positions of the plurality of chips within each of said blocks on the basis of the detection results so that correction for said plurality of chips can be accomplished without having to provide marks for each of said chips.

4,489,242

STORED POWER SYSTEM FOR VEHICLE ACCESSORIES

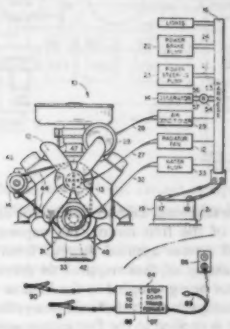
Marc T. Worst, 4 Rue Suffren Reymond, Principauté de, Monaco

Continuation-in-part of Ser. No. 227,503, Jan. 22, 1981, abandoned. This application Oct. 25, 1982, Ser. No. 436,296

Int. Cl.³ B60L *1/00*

U.S. Cl. 307—10 R **27 Claims**

1. In a land automotive vehicle utilizing a heat engine or a heat turbine or the like for supplying its entire forward drive force and having its own powered accessories including ones which use rotating power as well as other non-rotating electrically powered accessories, said accessories being specifically of the type which if operated together by power supplied mechanically, hydraulically or pneumatically by the engine or turbine and/or indirectly electrically by the engine or turbine through a generator, would require in total at least 5 horse power, assuming the vehicle is driven in accordance with the 1982 SAE 55 miles/hour Interstate Driving Cycle conditions, and assuming that all of the accessories are operating, at full load, the improvement comprising: substantially eliminating from said vehicle at least most of the rotary powered accessories which are driven by said engine or turbine directly or indirectly such that at most a minimal amount of engine or turbine power is required for driving any remaining accessories; and including in said vehicle all of said eliminated accessories as electrically powered accessories, at least some of which are rotary powered electrically and therefore include their own electric motor means, and means including externally chargable electrical battery means carried by said vehicle, or by a unit towed by it, normally maintained in a charged state by charging means supplied by stationary sources of electricity substantially independent of the mechanical load on said engine or turbine, said battery means being coupled with substantially all of said electrically powered accessories for operating the latter without using any mechanical power from said engine or turbine, either directly or through a generator driven by the engine or turbine, so long as the battery means is sufficiently charged, such that the engine or turbine uses at most a minimal amount of its power for accessories and thereby displays reduced fuel consumption, reduced generation of pollutants and improved vehicle performance, said vehicle being provided with means including a mechanically powered electrical generator for electrically powering said electrically powered accessories from mechanical power supplied by said engine or turbine in the event said battery means falls below a predetermined charge level, said means including said generator also including means for enabling said generator for providing electrical power to said accessories and for disabling the generator.



4,489,243

SOLAR POWERED ACTUATOR WITH CONTINUOUSLY VARIABLE AUXILIARY POWER CONTROL

Frank J. Nola, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

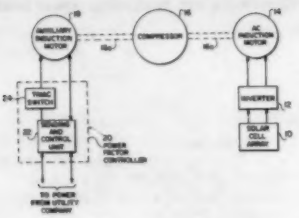
Filed May 6, 1982, Ser. No. 375,684

Int. Cl.³ H02P *7/80*

U.S. Cl. 307—64 **2 Claims**

1. In a solar energy powered system comprising an array of solar cells for receiving solar energy and for producing an electrical output in accordance therewith; a first induction motor including an output drive shaft; means for processing the electrical output of said solar cell array so as to produce an electrical drive signal for said first motor and for applying said drive signal to said first motor; a load driven from the output drive shaft of said first motor; a second, auxiliary induction motor, connected to said load and adapted to receive electrical power from an electrical utility, for, as required, carrying a proportion of the load in dependence on the amount of solar energy received by said solar cell array, the improvement wherein a power factor controller is connected to said second motor so as to control the voltage applied to said second motor in accordance with the proportion of the load carried by said

second motor such that the voltage applied to said second motor is decreased with a decrease in the proportion of the load carried by said second motor, said power factor controller including a thyristor switch and means for sensing the phase difference between the load current and voltage of said second motor and for controlling switching of said thyristor switch to control the voltage applied to the second motor in accordance with the sensed phase difference between said load current and voltage, said processing means comprising an inverter for converting the output of the solar cell array into an alternating current signal, the number of solar cells being in excess of that



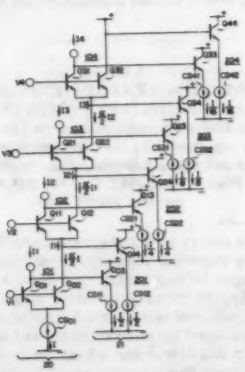
required to drive said load, said second motor being coupled to the drive shaft of the first motor, the capacity of said first motor, with full power applied thereto from the solar cell array, being in excess of that required to drive the load, and said second motor being coupled to the load as as to be driven as a generator under the control of said power factor controller when full power is applied to the first motor, said power factor sensing overspeeding of the second motor and limiting the firing angle of the the thyristor switch to a minimum value so as to convert the second motor, during such overspeeding, into a generator whose output is fed back to the utility.

4,489,244

CURRENT SOURCE CIRCUIT

Katsumi Nagano, Hiratsuka, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 30, 1982, Ser. No. 373,732
Claims priority, application Japan, May 8, 1981, 56-69151
Int. Cl.³ H03K *13/04*
U.S. Cl. 307—296 R **14 Claims**



1. A current source circuit comprising:

A current division circuit and a correction circuit, said current division circuit comprising at least one current source and a plurality of current division stages, each stage including a current shunting transistor, said at least one current source and plurality of current shunting transistors of the current division stages being series-connected between a first voltage power source and a second voltage power source, each of said plurality of current division stages further comprising at least one current output transistor, the emitters of said current shunting transistor and said at least one current output transistor of each of said current division stages being commonly connected, the bases of said current shunting transistor and said at least one current output transistor of each of said current division stages being commonly connected and supplied with a predetermined voltage, and an output current being obtained from a collector of said at least one current output transistor of each of said current division stages; and

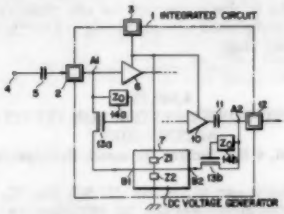
said correction circuit comprising a plurality of correction stages provided in correspondence to said current division stages, each of said correction stages including current sources, one end of each of which is connected to said first voltage power source and outputs a current equal to an output current from the corresponding one of said current division stages, the number of said latter current sources being the same as said transistors of each of said current division stages, and correction transistors, the emitter-collector paths of which are respectively connected between the other end of an individual one of said current sources and said second voltage power source and the bases of which are connected to individual ones of said collectors of said current output and current shunting transistors of a corresponding one of said current division stages and the number of said correction transistors being the same as said transistors of each of said corresponding current division stages.

4,489,245

D.C. VOLTAGE BIAS CIRCUIT IN AN INTEGRATED CIRCUIT

Tetsuya Iida, and Tatsuo Sakaue, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Continuation-in-part of Ser. No. 274,516, Jun. 17, 1981, abandoned. This application Apr. 11, 1984, Ser. No. 598,406
Claims priority, application Japan, Sep. 10, 1980, 55-125756
Int. Cl.³ H03K *17/16*; H03F *1/52*
U.S. Cl. 307—296 R **3 Claims**



1. In an integrated circuit having a signal input terminal which receives an input signal through a coupling capacitor; having an amplifier connected to a power supply terminal having an amplifier input terminal connected to said signal input terminal and having an amplifier output terminal connected to a semiconductor element provided in said integrated circuit; and having a D.C. voltage generator which includes a bias voltage output terminal, a first impedance connected between said bias voltage output terminal and said power supply terminal, a second impedance connected between said bias voltage output terminal and a ground terminal, a D.C. voltage bias circuit comprising:

a third impedance; and

a depletion mode MOS transistor connected at its source-drain path between said bias voltage output terminal of said D.C. voltage generator and said signal input terminal

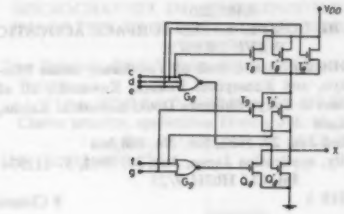
and coupled at its gate electrode to either its source or its drain through said third impedance.

4,489,246

FIELD EFFECT TRANSISTOR LOGIC CIRCUIT HAVING HIGH OPERATING SPEED AND LOW POWER CONSUMPTION

Koichi Nishiuchi, Sagamihara, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 16, 1981, Ser. No. 331,290
Claims priority, application Japan, Dec. 24, 1980, 55-183447; Dec. 24, 1980, 55-183430
Int. Cl.³ H03K 19/017, 19/094, 19/20
U.S. Cl. 307—448 4 Claims



1. A logic circuit having first and second power source terminals and a steady state, said logic circuit comprising:

a plurality of first logic gate means for generating first logical output signals, each of said first logic gate means having at least one logical input terminal for receiving a logical input signal and generating one of the first logical output signals in response to the logical input signal; and

second logic gate means, operatively coupled to said first logic gate means and having a logical output terminal, for generating a second logical output signal at the logical output terminal in response to the first logical output signals and the logical input signals and for cutting off a current path between the first and second power source terminals during the steady state, said second logic gate means comprising:

a plurality of driving field effect transistors operatively coupled between said logical output terminal and the first power source terminal, each of said driving field effect transistors having a gate terminal supplied with one of said first logical output signals; and

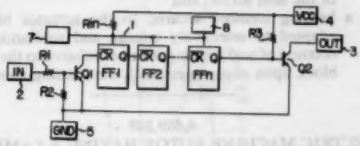
a plurality of load means operatively coupled between said logical output terminal and said second power source terminal, the number of said load means being equal to the number of said first logic gate means, each of said load means comprising at least one load field effect transistor, each of said load field effect transistors having a gate terminal supplied with a corresponding one of the first logical input signals of the corresponding one of said first logic gate means, the coupling of said driving field effect transistors between the logical output terminal and the first power source terminal being in parallel, and the coupling of said plurality of load means between the logical output terminal and the second power source terminal being in series, thereby cutting off a current path between the first and second power source terminals during the steady state in any logical state of said first logical input signals.

4,489,247

INTEGRATED INJECTION LOGIC CIRCUIT WITH TEST PADS ON INJECTOR COMMON LINE

Masashi Ikeda, Urawa; Yukuya Tokumaru, Yokosuka; Masanori Nakai, Ebina, and Masaki Ota, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Feb. 17, 1982, Ser. No. 349,207
Claims priority, application Japan, Mar. 18, 1981, 56-39236
Int. Cl.³ H03K 19/091; H01L 27/10, 29/70; G01R 19/00
U.S. Cl. 307—477 8 Claims



1. An integrated injection logic circuit comprising:

a plurality of integrated injection logic gates having injector means;

an injector common line to which the injector means of the respective integrated injection logic gates are commonly connected; and

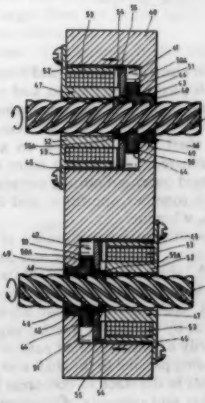
at least two test pads for electric probing provided on the injector common line.

4,489,248

LINEAR ACTUATOR

David A. Petersen, Austin, Tex., assignor to Victory Enterprises Technology, Inc., Austin, Tex.

Filed Jul. 25, 1983, Ser. No. 516,553
Int. Cl.³ H02K 7/10
U.S. Cl. 310—76 12 Claims



1. A linear actuator, comprising:

a frame;

a first lead screw operationally mounted to the frame and adapted for rotation, the first lead screw comprising high helix angle threads;

a second lead screw operationally mounted to the frame parallel to the first lead screw and adapted for rotation, the second lead screw comprising high helix angle threads; and

an actuator block secured to the first and second lead screws, including

means for selectively engaging the first lead screw to move the block in a first direction; and

means for selectively engaging the second lead screw to move the block in an opposing second direction;

wherein said means for selectively engaging the first lead screw and said means for selectively engaging the second lead screw each include:

a rotating member mounted in the actuator block in complementary threaded relationship with the lead screw, the rotating member being mounted for free rotation relative to the actuator block responsive to the rotation of the lead screw; and

a braking member secured to the actuator block and adapted to selectively engage and substantially stop rotation of said rotating member relative to the actuator block upon engagement with the rotating member.

4,489,249

ELECTRIC MACHINE ROTOR HAVING A LAMINATED AND SEGMENTED RIM

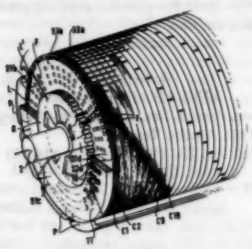
Michel Olivier, Danjoutin, France, assignor to Alsthom-Atlantique, Paris, France

Filed Mar. 25, 1983, Ser. No. 478,978

Claims priority, application France, Mar. 26, 1982, 82 05163

Int. Cl.³ H02K 1/22

U.S. Cl. 310—216 **5 Claims**



1. A rotor for an electric machine, said rotor having a laminated rim with pole pieces fixed thereto, said pole pieces carrying electric windings, and said rim occupying a substantially tubular volume between inner and outer co-axial cylindrical surfaces about a shaft and comprising an axially extending stack of plane laminated rings having outer edges which together constitute said outer cylindrical surface of the rim, and inner edges which together constitute said inner cylindrical surface of the rim, wherein:

each ring is constituted by a plurality of segments each extending over an angular sector and following one another round the shaft to make up a substantially complete circular ring with radially extending gaps between adjacent segments, said gaps in any two adjacent rings being angularly offset by a segment overlap angle (which angle is not necessarily a constant for all pairs of adjacent rings), tie rods extending parallel to the shaft and passing through successive rings in the stack to compress the stack axially to hold together said assembly of segments making up the rim;

the outer edges of the segments bearing stamped crenellations of the sheet from which the segment's constitutent laminations are made, whereby the outer surface of the assembled rim has axially extending keys for fixing said pole pieces;

the segment overlap angle is chosen in such a manner that two successive rings offset by said angle have matching crenellations so that the keys are continuous along the outer surface of the rim; and

the pole pieces extend axially along the rim, projecting from the outer surface thereof, being fixed to a plurality of said keys and succeeding one another at a pole pitch;

the improvement wherein:

(a) all of said keys are at a regular fixing pitch around said outer surface of the rim such that rotating any one ring through said fixing pitch or an integer multiple of said fixing pitch re-aligns the keys in the outer surface of the rim;

(b) the keys are in excess over that necessary for fixing the pole pieces, whereby a proportion of the keys along any given rotor rim are not, in fact, used;

(c) the overlap angle is equal to an integer number of fixing pitch steps but is less than a single pole pitch step thereby increasing the rim's strength against tangential forces; and

(d) the tie rods exert sufficient axial compression force to ensure that, when the rotor rotates and applies centrifugal force to the rings, the resulting tangential tension in each ring is transmitted across the gaps between the segments thereof by virtue of the friction forces set up between adjacent rings by said axial compression of the tie rods.

4,489,250

TEMPERATURE COMPENSATED SURFACE ACOUSTIC WAVE DEVICE

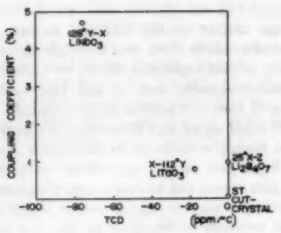
Yasuo Ebata; Hitoshi Suzuki, both of Yokohama; Sadao Matsumura, Tokyo, and Katsuyoshi Fukuta, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 27, 1983, Ser. No. 508,044

Claims priority, application Japan, Jun. 30, 1982, 57-112974

Int. Cl.³ H03H 9/25

U.S. Cl. 310—313 A **8 Claims**



1. A temperature compensated surface acoustic wave device comprising:

a substrate formed of a lithium tetraborate single crystal, cut angles of said substrate and the propagation direction of a surface acoustic wave being expressed by Eulerian angles

$$(90°+\lambda,\ 90°+\mu,\ 90°+\theta);$$

a film-like electrode formed on said substrate and having a thickness t normalized by a wavelength of said surface acoustic wave, said electrode being formed of a metallic material comprising aluminum, and the thickness t being set to satisfy the inequality (2) below:

$$f(\lambda, \mu, \theta) \leqq t \leqq F(\lambda, \mu, \theta) \quad (2)$$

where functions $F(\lambda, \mu, \theta)$ and $f(\lambda, \mu, \theta)$ satisfy equations (3) to (8) below:

$$F(\lambda, 0, 0) = 1.6 \times 10^{-2} + 8.8 + 10^{-6}\lambda - 3.5 \times 10^{-5}\lambda^2 + 1.1 \times 10^{-6}\lambda^3 - 1.3 \times 10^{-8}\lambda^4 \quad (3)$$

$$F(0, \mu, 0) = 1.6 \times 10^{-2} + 5.3 \times 10^{-4}\mu + 5.9 \times 10^{-5}\mu^2 - 8.6 \times 10^{-6}\mu^3 + 2.7 \times 10^{-7}\mu^4 - 2.9 \times 10^{-9}\mu^5 \quad (4)$$

-continued

$$F(0, 0, \theta) = 1.6 \times 10^{-2} - 2.4 \times 10^{-4}\theta - 1.0 \times 10^{-4}\theta^2 + 3.4 \times 1\text{-}^{-7}\theta^3 \quad (5)$$

$$f(\lambda, 0, 0) = 9.5 \times 10^{-3} + 1.2 \times 10^{-4}\lambda - 3.9 \times 10^{-5}\lambda^2 + 1.3 \times 10^{-6}\lambda^3 - 1.6 \times 10^{-8}\lambda^4 \quad (6)$$

$$f(0, \mu, 0) = 9.5 \times 10^{-3} + 8.4 \times 10^{-4}\mu - 9.4 \times 10^{-5}\mu^2 + 6.6 \times 10^{-6}\mu^3 - 3.0 \times 10^{-7}\mu^4 + 4.5 \times 10^{-9}\mu^5 \quad (7)$$

$$f(0, 0, \theta) = 9.5 \times 10^{-3} \times 3.0 \times 10^{-4}\theta - 2.0 \times 10^{-4}\theta^2 + 3.6 \times 10^{-6}\theta^3 \quad (8)$$

and,

said electrode generating said surface acoustic wave, said surface acoustic wave being propagated along a surface of said substrate along the propagation direction.

4,489,251

MICROCHANNEL IMAGE INTENSIFIER TUBE AND IMAGE PICK-UP SYSTEM COMPRISING A TUBE OF THIS TYPE

Yves Beauvais, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jul. 7, 1981, Ser. No. 281,294
Claims priority, application France, Jul. 11, 1980, 80 15496
Int. Cl.³ H01J *43/04, 43/28*
U.S. Cl. 313—105 CM **10 Claims**

1. An image intensifier tube comprising

(a) a vacuum enclosure including an entrance window (2) for receiving radiation and an exit window (6);

(b) a photocathode (1) inside said envelope at said entrance window for receiving said radiation and providing electrons into said tube in accordance with said received radiation;

(c) a luminescent scree (5) inside said envelope at said exit window for converting electrons into exiting visible radiation;

(d) means including at least one electrode (31) inside said envelope between said photocathode (1) and said luminescent screen (5) for directing said electrons toward said screen;

(e) a microchar-el element (4) between said electrode and screen (5) and in proximity of said screen; said microchannel element receiving said accelerated electrons and multiplying their number which then impinge upon said screen; said element also generating undesirable ions which are attracted toward said electrode;

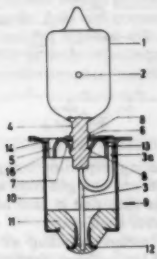
(f) a getter (60) positioned at said electrode for absorbing said undesirable ions, thereby reducing the quantity of generated ions inside the tube and thus extending the life of said tube.

4,489,252

ELECTRIC LAMP

Fritz Eckhardt, Dettingen, Fed. Rep. of Germany, assignor to Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH, Munich, Fed. Rep. of Germany

Filed Sep. 10, 1982, Ser. No. 416,633
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1981, 8131006[U]
Int. Cl.³ H01J *5/48, 5/50, 5/46*
U.S. Cl. 313—318 **14 Claims**



1. An electric lamp comprising

a lamp bulb (1) made of refractory glass material;

a lamp press (4) formed at the bottom of the lamp bulb and having locating projections (8);

a filament (2) mounted in the lamp bulb (1) and acting as the luminous element of the lamp;

two lead-in wires (3) which contact the filament (2) in the lamp bulb (1) and pass through the lamp press (4) to the exterior of the bulb;

a metal sleeve (5) of cylindrical shape, provided with an opening (6) in which the lamp press (4) is inserted, said sleeve having inwardly bent flaps (7) which grip and position the lamp press (4) by pressing with an elastic force against the projections (8) of the lamp press;

a metal base shell (10) of cylindrical shape, having a diameter slightly larger than that of the metal sleeve (5) receiving said metal sleeve (5);

a bottom contact (12) secured to the base shell (10) and insulated therefrom;

wherein:

a first lead-in wire is carried to the bottom contact (12) of the base shell to provide one connection terminal for the filament;

the metal sleeve (5) is formed with an inwardly extending groove (13) located at the outer rim thereof, an end portion (3a) of a second lead-in wire being placed in said groove (13) to establish electrical contact of the second lead-in wire with the metal base shell (10) inwardly thereof, and without causing an obstruction or bulging of the exterior surface of the base shell (10); and

wherein a solder connection (16) is provided between the metal sleeve (5) and the base shell (10) to reliably and securely position the filament within the bulb with respect to the base shell, the solder connection also soldering the second lead-in wire located in the groove (13) to the base shell inwardly thereof.

4,489,253

AUTOMATIC DEGAUSSING CIRCUIT WITH SWITCH MODE POWER SUPPLY

Theodore J. Godawski, Des Plaines, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Nov. 1, 1982, Ser. No. 438,197
Int. Cl.³ H01J *29/06*
U.S. Cl. 315—8 **9 Claims**

1. A color television receiver comprising:

a continuously energized switch mode power supply having a high voltage terminal and a low voltage terminal;

low voltage switch coupled to the low voltage terminal of said power supply for turning said receiver on and off;

voltage multiplier means connected to the high voltage terminal;

degaussing means, including a picture tube degaussing coil and a resonating capacitor, connected to said power supply, said resonating capacitor being connected to said multiplier output and charged from said power supply to a voltage higher than that at said high voltage terminal when said receiver is off; and

electronic switch means including an energizing terminal coupled to said low voltage switch, said switch electrically connecting said resonating capacitor in parallel with said degaussing coil for producing a degaussing current therein whenever said receiver is turned on.

4,489,254

MAGNETRON

Tokuju Koinuma, Kawasaki; Norio Tashiro, Yokohama, and Kaizo Yamamoto, Atsugi, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki and Nippon Hoso Kyokai, Tokyo, both of, Japan

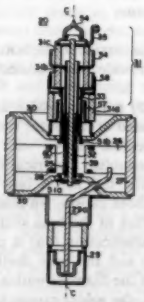
PCT No. PCT/JP81/00250, § 371 Date May 19, 1982, § 102(e) Date May 19, 1982, PCT Pub. No. WO82/01101, PCT Pub. Date Apr. 1, 1982

PCT Filed Sep. 22, 1981, Ser. No. 385,399

Claims priority, application Japan, Sep. 22, 1980, 55-130762; Apr. 22, 1981, 56-60833

Int. Cl.³ H01J *25/50*

U.S. Cl. 315—39.51 **8 Claims**



1. A magnetron comprising a cylindrical anode which has a plurality of cavities therein, an electron emissive cathode which is coaxial with said cylindrical anode and is disposed inside said cylindrical anode, said cathode comprising a spiral-shaped directly-heated cathode which consists of a refractory metal as a base material, a cathode stem which electrically insulates said cathode from said cylindrical anode and supports said electron emissive cathode, a magnetic field generating device for generating a magnetic field parallel to the axis of said cylindrical cathode in an interaction space between said electron emissive cathode and said cylindrical anode, an output antenna conductor for feeding microwave energy generated from said plurality of cavities to a load, and a drain electrode installed near said spiral-shaped directly-heated cathode and in a position where electrons emitted from said cathode to said cylindrical anode are not interfered with, said drain electrode being wound at the same pitch of the turns of said spiral-shaped directly-heated cathode, and turns of said drain electrode extending between the turns of said spiral-shaped directly-heated cathode.

4,489,255

DISCHARGE LAMP STARTER AND STARTING AND OPERATING CIRCUITRY

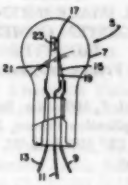
Nikolaos Barakitis, Haverhill, and Sheppard Cohen, Danvers, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jul. 19, 1982, Ser. No. 398,722

The portion of the term of this patent subsequent to Dec. 6, 2000, has been disclaimed.

Int. Cl.³ H01J *7/44*

U.S. Cl. 315—73 **14 Claims**



1. A starter device comprising:

a hermetically sealed envelope with three electrically conductive leads extending outwardly therefrom;

an electrical conductor and a first bimetal mounted on a first and a second one of said electrically conductive leads within said envelope, said first bimetal and electrical conductor joined at an end opposite from the mounted end to form a first contact member; and

a second bimetal mounted on a third one of said electrically conductive leads within said envelope and having an end opposite from the mounted end forming a second contact member of a normally-closed (N/C) switch, said first and second bimetals configured to have a flexure in diametrically opposite directions upon application of energy to said conductive leads whereby said first and second contact members forming a normally-closed switch in the absence of energization of said leads form an open switch upon energization of said leads.

4,489,256

PRIMARY AND SECONDARY DYNAMIC BRAKING SYSTEM

Stephen L. Brodsky, Camarillo, Calif., assignor to Everest & Jennings, Inc., Camarillo, Calif.

Filed Dec. 27, 1983, Ser. No. 565,295

Int. Cl.³ H02P *3/14*

U.S. Cl. 318—87 **3 Claims**

1. A primary and secondary dynamic braking system for first and second motors including, in combination:

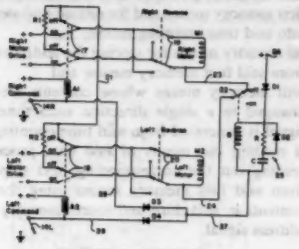
(a) first and second resistors;

(b) first and second primary switches individually controllable from a normally off position in which said first and second resistors are connected across the terminals of said first and second motors to provide dynamic braking for said motors and in which first terminals of said first and second motors are connected together when both switches are off, to an on position to energize said first and second motors respectively for normal operation;

(c) a secondary switch having a normal off position in which

the first and second motors have their corresponding second terminals connected together and an on position in which said second terminals of said first and second motors are disconnected; and

(d) a timing circuit means for operating said secondary switch responsive to operation of either of said primary first and second switches to their on positions to move said



secondary switch to its on position and thereafter responsive to return of both of said primary first and second switches to their off positions for moving said secondary switch to its off position to reconnect said second terminals of said first and second motors only after a given period of time to thereby provide secondary braking to said motors.

4,489,257

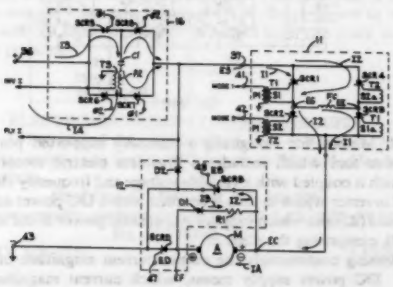
DRIVING AND BRAKING SYSTEM FOR ELECTRIC MOTORS

Carl E. Lindow, San Jose, Calif., assignor to FMC Corporation, Chicago, Ill.

Filed Oct. 14, 1983, Ser. No. 541,846

Int. Cl.³ H02P 3/10

U.S. Cl. 318—258 **17 Claims**



1. A dynamic driving and braking system for controlling operation of an electric motor having an armature and a field coil, said system for use with a source of drive signals, a source of brake signals, and a source of variable power having first and second power terminals, said system comprising:

first and second thyristors each having a pair of current terminals and a control terminal;

means for connecting said field coil between said first power terminal and a first end of said motor armature;

means for connecting a first current terminal of said first thyristor to a second end of said motor armature;

means for connecting a second current terminal of said first thyristor to said second power terminal;

means for connecting a first current terminal of said second thyristor to said first end of said motor armature;

means for connecting a second current terminal of said second thyristor to said second power terminal;

a diode;

a resistor;

means for serially connecting said diode and said resistor between said first and said second ends of said motor armature;

means for connecting said source of drive signals to said control terminal of said first thyristor;

means for connecting said source of brake signals to said control terminal of said second thyristor; and

means for reversing the field coil connections between said first power terminal and said first end of said motor armature to reverse the polarity of voltage across said motor armature and provide dynamic braking for said motor.

4,489,258

PROPULSION SYSTEM FOR VEHICLES WITH A D-C MACHINE

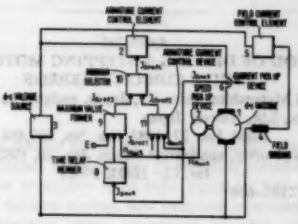
Hans Kahlen, Weinheim-Sulzbach, and Jürgen Angelis, Mannheim, both of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie, AG, Mannheim, Fed. Rep. of Germany

Filed Feb. 3, 1983, Ser. No. 463,551

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1982, 3203682

Int. Cl.³ G05B 5/00

U.S. Cl. 318—317 **5 Claims**



1. Propulsion system for vehicles, comprising a d-c machine, an armature current control element connected to said d-c machine, an alternating member having an output side connected to said armature control element and having an input side, an armature current control device connected between said input side of said alternating member and said d-c machine for delivering a first armature current reference value to said alternating member, a maximum value former connected between said input side of said alternating member and said d-c machine for receiving the value of the actual machine speed and the actual armature current from said d-c machine and for delivering a second maximally permissible armature current reference value to said alternating member, said alternating member passing on the smaller of said first and second armature current reference values to said armature current control element.

4,489,259

METHOD AND APPARATUS FOR CONTROLLING A STEPPER MOTOR

James N. J. White, Kinross; David S. Ruxton, Crieff, and Alec D. Stewart, Fife, all of Scotland, assignors to Rodime Limited, Scotland

Filed Apr. 29, 1982, Ser. No. 373,281

Claims priority, application United Kingdom, May 2, 1981, 8113614

Int. Cl.³ H02K 29/04

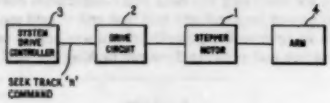
U.S. Cl. 318—696 **22 Claims**

1. A method of minimising the tracking overshoots in an open loop disk device having a signal processing means, pro-

grammable memory means connected to the signal processing means, said signal processing means having an output connected to the stepper motor, and an input connected to a controller for use with the disk drive, the programmable memory means including a program for controlling the movement of the stepper motor from one track to another,

said method comprising the steps of dividing the duration of a least one current pulse period applied to the stepper motor into a predetermined number of pulse elements,

applying a finite amount of current to a winding of said



stepper motor in said at least one pulse element, said finite amount of current being determined by the net ratio of the time for which current is applied to the winding of the stepper motor to the time for which no current is applied to that winding during said pulse element,

and varying the ratio of current-on time to current-off time in each pulse element whereby the magnitude of current in the pulse period is determined by the net current in each pulse element and is applied to the winding of the stepper motor in a predetermined manner over the duration of the pulse.

4,489,260

METHOD OF DRIVING A STEPPING MOTOR AND A DRIVE CIRCUIT THEREOF

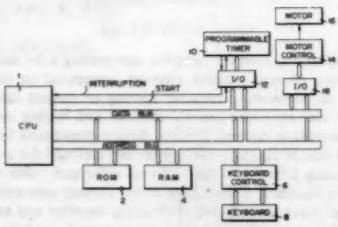
Tsuyoshi Matsushita, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Jun. 27, 1983, Ser. No. 508,494

Claims priority, application Japan, Jan. 20, 1983, 58/7705

Int. Cl.³ H02K *29/04*

U.S. Cl. 318—696 **2 Claims**



1. A stepping motor drive circuit comprising:

first memory means for storing a plurality of driving speed patterns each having a reference address and a series of step timing data;

second memory means for storing step data indicative of the number of driving rotational steps;

said first memory means including a memory area having address locations for storing address data indicative of the respective reference addresses of said driving speed patterns, the address locations being designated by said step data which is stored in said second memory means;

motor driving means; and

data processing circuit means including means for selecting one of said driving speed patterns on the basis of the step data stored in said second memory means; means for sequentially reading out the series of step timing data related to said selected driving speed pattern from said first memory means; time counting means for generating an output signal when a time period corresponding to timing data set therein has elapsed; and data processing means for supplying motor driving data to said motor driving means each time a period of time corresponding to the step timing data sequentially read out elapses;

said data processing means including:

means for supplying said motor driving data to

said motor driving means in response to the output signal from said time counting means;

means for reading out the next step timing data from said first memory means and for setting said step timing data into said time counting means;

third memory means for storing the address data read out from said first memory means; and

fourth memory means whose contents are sequentially changed in a single direction each time said output signal is generated from said time counting means;

said reading out means of said data processing means reading out the corresponding next step timing data from said first memory means using the sum of the contents in said third and fourth memory means as an address signal.

4,489,261

METHOD AND MEANS FOR FEEDING ELECTRIC ENERGY TO A PORTABLE POWER TOOL

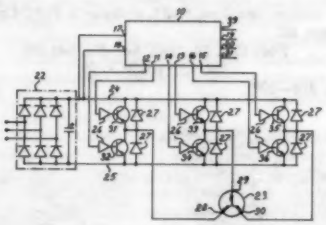
C. Sverker M. Hartwig, Täby, and Erik A. Ljung, Stockholm, both of Swedea, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Dec. 15, 1982, Ser. No. 450,080

Claims priority, application Switzerland, Dec. 18, 1981, 8099/81

Int. Cl.³ H02P *5/40*

U.S. Cl. 318—700 **13 Claims**



1. Method for energizing a manually supported portable power tool which includes a brushless electric motor (23) which is coupled with a variable voltage and frequency electrical inverter which in turn is coupled with a DC power supply means (22) and which supplies AC electric power to the motor (23), comprising the steps of:

sensing continuously the output current magnitude of said DC power supply means, which current magnitude is indicative of the torque load applied on the motor as well as the motor slip;

adjusting continuously for AC output voltage of said inverter in response to the magnitude of the torque load indicated by said sensed DC current output of said DC power supply means for minimizing the motor slip when increasing the motor load from zero to the maximum level; and

continuously controlling the frequency of the AC output voltage of said inverter as a function of the motor speed indicated by the sensed DC current output of said DC power supply means for maintaining the frequency at a constant level during motor load variations between zero and the maximum level and for matching the frequency to the motor speed indicated by said sensed DC current output of said DC power supply means at motor speeds

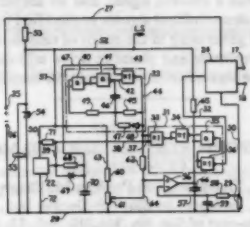
below the motor speed indicated at the maximum motor load level to prevent stalling of the motor.

4,489,262

DEVICE FOR CONTROLLING A RELUCTANCE MOTOR

Lars G. Morén, Huddinge; Ulf P. Berg, Högersten, and Bengt G. Hedlund, Stockholm, all of Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Sep. 19, 1983, Ser. No. 533,406
Claims priority, application Sweden, Oct. 1, 1982, 8205624
Int. Cl.³ H02K 29/00
U.S. Cl. 318—700 13 Claims



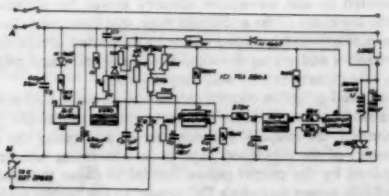
1. In a device for controlling a two-pole reluctance motor, having a stator with only two diametrically opposed poles with windings, and a rotor of soft magnetic material having two correspondingly positioned poles, each rotor pole having a first portion with a peripheral extension which coincides with the corresponding extension of the respective stator pole, and an additional portion adjacent the first and stepped radially inwardly and having a pole surface closer to the shaft of the rotor than the first portion, the improvement wherein said device comprises means applying current to said windings which are of insufficient amplitude to saturate said poles when starting with the rotor in a positive torque position, and means to drive the motor by current pulses of a magnitude which in the area of pole overlap saturates at least those portions of the stator and the rotor pole, respectively, situated closest to the pole surfaces when the motor is started with the rotor in a stable position.

4,489,263

ELECTRONIC SPEED CONTROL CIRCUITS

Mark A. Potter, and John S. Crawford, both of Adelaide, Australia, assignors to Technical Components Pty. Ltd., Hendon, Australia

Filed Oct. 17, 1983, Ser. No. 542,856
Claims priority, application Australia, Oct. 20, 1982, PF6435
Int. Cl.³ H02P 5/34
U.S. Cl. 318—727 5 Claims



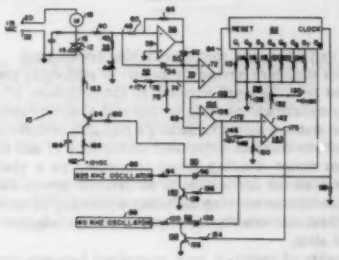
1. A circuit arrangement wherein the speed of an induction motor is controlled by varying the phase angle at which the alternating supply waveform is switched using an electronic switching device and where the voltage across the switching device during the time it is off is rectified and used as the charging voltage for the phase firing circuit; the phase at which the switching device is fired being determined by the rectified voltage and a resistor - capacitor timing network in which the capacitor is discharged at a fixed time relative to each half cycle and the firing point is set such that the switching device is switched on whenever the capacitor voltage reaches a certain value.

4,489,264

POWER CONTROL FOR AC MOTOR

Richard W. Dabney, Toney, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 14, 1983, Ser. No. 504,345
Int. Cl.³ H02P 5/40
U.S. Cl. 318—729 9 Claims



1. A power control for an AC induction motor comprising:

switching means having a pair of switched terminals and a gate input responsive to an input signal for interconnecting, and thereby closing, said switched terminals;

an AC induction motor connected in series with said switched terminals of said switching means and a source of AC power;

voltage sensing means connected across said switched terminals of said switching means for providing a signal voltage which, when said switching means is in an open state, is a difference voltage, being a function of the difference between the motor voltage and line voltage;

timing means responsive to said signal voltage for developing a control signal spaced in time after the commencement of said difference voltage and including means responsive to the amplitude of said signal voltage for adjusting the length of time between said commencement and the occurrence of said control signal as an inverse function of the amplitude of said signal voltage; and

signal means responsive to said control signal for providing a gating signal to said gate input of said switching means upon the occurrence of said control signal,

said timing means comprising:

counting means, having a counting input and a selected count output connected to said signal responsive means, for providing said control signal;

signal generating means for generating at least a first frequency signal and a second, higher frequency signal; and

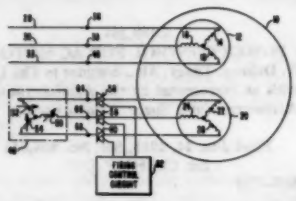
frequency control means coupled to said signal generating means and to said voltage sensing for providing, responsive to said difference voltage, a frequency signal from said signal generating means to said counting input of said counting means which is a direct function of the amplitude of said difference voltage, whereby the time between turn off and turn on of said switching means is decreased as a direct function of said difference voltage.

4,489,265

ELECTRIC MACHINE WITH CONTINUOUS POLE PHASE MODULATION

Stephen B. Kuznetsov, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 24, 1983, Ser. No. 478,564
Int. Cl.³ H02P 7/48
U.S. Cl. 318—773 12 Claims



1. A variable speed electric machine comprising:

a stator structure having a plurality of uniformly distributed axial slots disposed adjacent to the periphery of a generally cylindrical opening within said stator structure;

a main stator winding including a plurality of coils having at least one conductor disposed within each of said slots, said main stator winding being connected to a plurality of terminals for connection to an external power source;

a control stator winding including a plurality of coils having at least one conductor disposed within selected ones of said slots;

a plurality of switches, each connected between one coil of said control stator winding and one of said terminals for connection to said external power source;

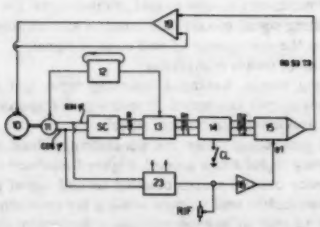
means for controlling the operation of said switches to alter the phase change of current flowing in adjacent slots of said stator structure, thereby changing the effective number of poles along the periphery of said generally cylindrical opening by varying the magnitude of current flowing in said control stator winding.

4,489,266

CIRCUIT AND A METHOD FOR PROCESSING AMPLITUDE AND PHASE VARIABLE MULTIPHASE SIGNALS, WHICH ARE REQUIRED AS CURRENT OR VOLTAGE REFERENCE TO DRIVE SYNCHRONOUS MOTORS

Luciano Franzolini, Milan, Italy, assignor to SP, EL. s.r.l., Italy

Filed Mar. 18, 1983, Ser. No. 476,466
Claims priority, application Italy, Mar. 23, 1982, 20337 A/82
Int. Cl.³ H02P 1/40
U.S. Cl. 318—800 8 Claims



1. A circuit for generating amplitude and phase variable multiphase signals, which are required as current or voltage to drive an electric synchronous motor comprising a synchronous motor having a rotor and a stator, a multiphase angular position transducer of a precision synchro-resolver type having a rotor rigidly connected to the rotor of said motor, with the same polar and configuration and number of poles as said motor, but with its polar axis mechanically out of phase by 90 degrees with the polar axis of said motor, said transducer generating analog modulated signals representing the angular position of the rotor of said transducer in a rotary vectorial system, demodulator means to demodulate the output signals of said transducer to produce demodulated signals representing angular position in said rotary vectorial system, phase shifting means for shifting the angular position represented by said demodulated signals in said rotary vectorial system, signal modifying means for modifying said demodulated signals in accordance with a control signal, and an amplifier connected to receive the demodulated signals as modified by said modifying means and generating in the stator of said motor currents of determined amplitude and phase to drive said motor in accordance with the signals received from said amplifier.

4,489,267

WAVEFORM SYNTHESIZER AND MOTOR CONTROLLER

David A. Saar, Timonium, and Pradeep M. Bhagwat, Baltimore, both of Md., assignors to Black & Decker Inc., Newark, Del.

Continuation-in-part of Ser. No. 348,319, Feb. 12, 1982, Pat. No. 4,447,786. This application Dec. 29, 1982, Ser. No. 452,834
Int. Cl.³ H02P 5/40
U.S. Cl. 318—811 17 Claims

1. A motor controller for selectively controlling an AC motor by providing a controlled power waveform thereto of selected wave shape and frequency, said motor controller comprising:

a waveform memory means divided into P addressable pages representing P available wave shapes with each page divided into S addressable segments, the segments of each page having binary switch control information stored therein, the pages and the segments of each page addressable through a memory address port to provide the so-addressed switch control information to switch control data lines;

selectively gatable switch means connected between a DC power source means to at least one output power node for connection to the motor to be controlled and connected to said switch control data lines;

stored-program control means connected to said waveform memory means for addressing a selected one of the pages available in said waveform memory means;

presettable frequency divider means connecter to a source of input pulses having a selected repetition rate and connected to said waveform memory means for addressing the segments of the addressed page, said frequency divider means providing output pulses at a selected divide-down ratio for addressing the segments of the addressed page at a rate determined by said output pulses;

said stored-program control means connected to said presettable frequency divider means for setting the divide ratio thereof, the frequency divider means addressing the segments of the addressed page at an addressing rate determined by the output pulses thereof to cause the gatable switch means to switch DC power to the output node to synthesize a waveform of selected wave shape in accordance with the stored binary switch control information of the addressed page and of selected frequency in accordance with the segment addressing rate; and

analog-to-digital converter means connected to the DC power supply means and to said stored-program control

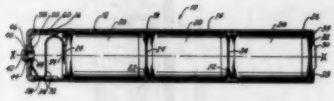
means for providing a digital representation to said stored-program control means of a characteristic associated with the DC power.

4,489,268

RECHARGEABLE BATTERY WITH SEPARATE CHARGING TERMINAL CONTACT RING

Robert W. Beachy, Gainesville, Fla., assignor to General Electric Company, Gainesville, Fla.

Filed Jan. 5, 1983, Ser. No. 455,768
Int. Cl.³ H02J 7/00
U.S. Cl. 320—2 6 Claims



6. A rechargeable battery comprising:

a hollow generally cylindrical circumferentially and axially extending battery housing having a cavity extending from a first end of said cylindrical housing to a second end of said cylindrical housing, said housing having a window providing an opening from said cavity to the exterior of said housing;

a plurality of rechargeable cells disposed in said cavity and connected electrically in series relationship;

a first power terminal contact member disposed at said first end of said cylindrical housing and electrically connected to a first one of said cells in said series, said first member having a protuberance protruding from said first end of said housing;

a second power terminal contact member disposed at said second end of said housing, said second member having a first portion protruding from said second end of said housing and an expanded end portion disposed in said cavity;

a strap member disposed at said second end of said cavity, said strap member including a first leg portion entrapped between said housing and said expanded end portion of said second power terminal contact, said strap member including a second leg portion disposed in abutting contact with a last one of said cells in said series, said strap member further including an intermediate portion electrically connecting said first leg portion with said second leg portion;

an annular charging contact terminal extending substantially 360 degrees about and exterior to said housing proximate said window, said intermediate portion of said strap member projecting through said window to thereby engage said annular charging contact terminal and establish electrical connection therewith whereby said charging terminal and said first power terminal form the charging circuit terminals for said battery.

4,489,269

ATOMIC BATTERY WITH BEAM SWITCHING

Ellsworth A. Edling, 2910 NE. 11th Ter., Pompano Beach, Fla. 33064; Richard P. McKenna, 122 Duvall La., Apt. 301, Gaithersburg, Md. 20877; Frederick D. Trexler, Hillside Dr., Houghton, N.Y. 14744, and E. Thomas Peterick, Jr., 310 NW. 37th St., Pompano Beach, Fla. 33064

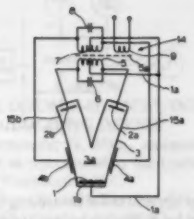
Filed Dec. 1, 1982, Ser. No. 445,980
Int. Cl.³ H02M 1/02; G21H 1/00
U.S. Cl. 322—2 R 11 Claims

1. An atomic battery with beam switching comprising in combination:

a vessel constructed of an airtight, electrically insulating material, having outer walls defining a generally airless inner cavity, said cavity consisting of

a lower cavity section, said lower cavity section extending upward into at least one pair of upward projecting, upwardly elongated, branch cavity sections, where each pair of said branch cavity sections consists of a first and a second branch cavity section, and where said lower cavity section and said branch cavity sections are connected by a neck cavity section,

said lower cavity section containing at its lower inner surface



emitter electrode means, further comprising radioactive material emitting electrically charged particles;

at least one pair of reflecting electrode means;

a plurality of collecting electrode means;

control network means, comprising windings and capacitors;

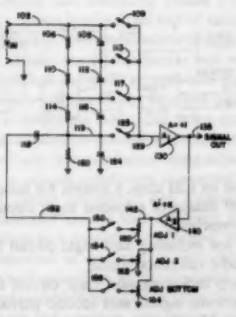
connecting means interconnecting said control network means with collecting electrode means, and with said reflecting electrode means and with an external load.

4,489,270

COMPENSATION OF A HIGH VOLTAGE ATTENUATOR

Calvin D. Diller, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Feb. 7, 1983, Ser. No. 464,283
Int. Cl.³ G05F 3/08; H01P 1/22
U.S. Cl. 323—354 6 Claims



1. A compensated attenuator, comprising:

a divider comprising a plurality of impedance elements for providing a plurality of selectable attenuation paths between a signal input line and a signal output line; and

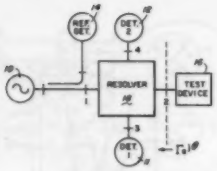
compensation means coupled to said divider and being responsive to an output signal on said signal output line to vary the effective divider impedance dynamically.

4,489,271

REFLECTION COEFFICIENT MEASUREMENTS

Gordon P. Riblet, 116 Westgate Rd., Wellesley, Mass. 02181

Continuation-in-part of Ser. No. 3,497, Jan. 15, 1979, abandoned. This application Dec. 29, 1980, Ser. No. 221,005
Int. Cl.³ G01R 27/04; H01P 5/12; G01B 9/02
U.S. Cl. 324—58 B 28 Claims



25. A four port apparatus for measuring the reflection coefficient of a device by detecting power levels, comprising:

main coupling means having means defining a first port for receiving a test signal and means defining a second port for coupling to the device being measured,

first and second secondary coupling means having means defining third and fourth ports, respectively of the apparatus,

first and second detectors connected respectively at the third and fourth ports,

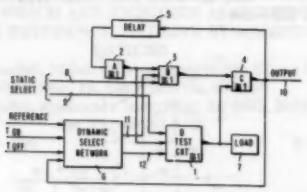
and means coupling each secondary coupling means to the main coupling means such that when feeding a signal into one secondary port the signals from the first and second ports are the same and when feeding the other secondary port the signals from the first and second ports differ only in a phase difference of 90°.

4,489,272

TEST CIRCUIT FOR TURN-ON AND TURN-OFF DELAY MEASUREMENTS

Mark H. McLeod, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 6, 1982, Ser. No. 395,173
Int. Cl.³ G01R 17/02, 29/02, 31/28
U.S. Cl. 324—73 R 9 Claims



1. For use on an LSI chip, a system for measuring the turn-on and turn-off delays of a loaded logic circuit on said chip, said system comprising:

a first loop not including said logic circuit for producing a first periodic reference signal;

a second loop including said logic circuit for producing a second periodic signal, said second periodic signal being related to said reference signal in a manner that is dependent upon the turn-on delay of said logic circuit;

a third loop including said logic circuit and producing a third periodic signal, said third periodic signal being related to said reference signal in a manner that is dependent upon the turn-off delay of said logic circuit; and

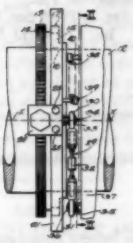
means for causing mutually exclusive production by said loops of each of said periodic signals.

4,489,273

APPARATUS FOR MEASURING ROTATIONAL VELOCITY OF A SHAFT

Richard L. Orner, Jr., and Charles W. Smith, both of York, Pa., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Jun. 28, 1982, Ser. No. 393,184
Int. Cl.³ G01P 3/48, 3/54
U.S. Cl. 324—166 5 Claims



1. An apparatus for measuring the rotational speed of a rotary shaft which rotates relative to a stationary member about an axis of rotation comprising:

a gear affixed to said shaft for rotation therewith and concentric with said axis of rotation;

a roller bearing assembly having an inner circular member secured to said shaft for rotation therewith and an outer circular member coupled to said inner member with said inner and outer members freely movable relative to one another in a circular path concentric with said axis and restrained from relative axial movements;

a rotational signal transducer;

means for securing said rotational signal transducer to said outer circular member with said transducer positioned to detect and measure the rotational speed of said gear;

a restraining rod having a first end pivotally connected to said transducer; said rod extending from said first end tangentially to said axis of rotation and terminating at a second end pivotally connected to said stationary member with said pivotable connections permitting nonrotational movement of said transducer with said shift with said roller bearing assembly preventing axial and radial movement of said transducer relative to said shaft.

4,489,274

ROTATING SQUID MAGNETOMETERS AND GRADIOMETERS

Ted G. Berlincourt, McLean, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 10, 1980, Ser. No. 214,839
Int. Cl.³ G01R 33/02
U.S. Cl. 324—248 16 Claims

1. A continuously rotatable SQUID device for measuring magnetic field vector components, said device comprising:

a non-electrically-conductive cryogenic container having mutually orthogonal first and second axes and being rotatable about these axes,

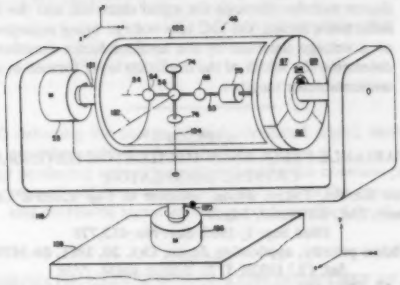
SQUID magnetometer sensor means mounted in the container and generally made up of a sensor loop, a signal coil, a pickoff coil and a SQUID; the sensor loop being mounted in the container in centered and spaced relation to the first and second axes and being electrically coupled to the signal coil, the SQUID being interposed between and inductively coupled to the signal and pickoff coils, the sensor loop providing a signal representative of the vector component of a magnetic field perpendicular to the plane of the sensor loop for every rotating position of the sensor loop,

yoke means mounting the container for rotation about its first axis,

platfor n means connected to the yoke means,

signal processing means connected to the pickoff coil and operatively associated with the container, yoke means and platform means for processing and analyzing the signal from the sensor loop during rotation of the loop in a magnetic field,

said yoke means including first non-magnetic motor means for continuously rotating the container about its first axis



at a frequency greater than approximately one (1) Hertz, and

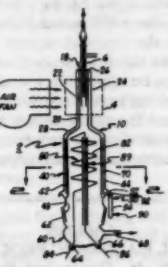
said platform means including second non-magnetic motor means for selectively rotating the container about its second axis whereby rotation of said container by at least said first motor means at a frequency greater than approximately 1 Hertz eliminates high background noise at low frequency so as to enable analysis by the processing means of the signal from the magnetometer sensor means and accurate description of vector components of the magnetic field.

4,489,275

HIGH TEMPERATURE SAMPLE HEATING FOR SPECTROSCOPIC STUDIES APPARATUS

Kenneth M. Sancier, Menlo Park, and Bernard J. Wood, Santa Clara, both of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Sep. 9, 1982, Ser. No. 416,337
Int. Cl.³ G01N *27/00*
U.S. Cl. 324—315 **20 Claims**



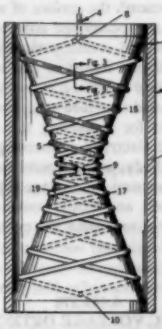
1. An improved sample heating apparatus comprising a double-walled evacuated cylindrical envelope having a first portion of reduced diameter capable of fitting into a cavity of a spectroscopic analysis device and capable of receiving a sample holder therein and a second portion of larger diameter having heating means mounted therein; means for passing heat generated in said second, larger diameter portion into said first reduced diameter portion to heat said sample holder therein; radiation shielding means comprising metallic means having a reflective surface thereon carried within the evacuated envelope of said larger diameter portion; and gettering means to react with gases within said evacuated envelope.

4,489,276

DUAL-CONE DOUBLE-HELICAL DOWNHOLE LOGGING DEVICE

Jiunn S. Yu, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 20, 1982, Ser. No. 341,021
Int. Cl.³ G01V *3/30*; H01Q *1/36*
U.S. Cl. 324—338 **6 Claims**



1. A downhole refractive index logging device comprising:

a first double-helix coil comprising: elongate dielectric means for supporting a coil;

said coil consisting of a coaxial cable having a center conductor and an outer conductor extending in one direction helically around said dielectric means from a first end position to a center position, an end of said cable being at the center position; a first conductor connected at one end to the end of said center conductor and extending in an opposite direction helically around said dielectric means from the center position to the first end position, said first conductor overlapping said cable twice during each turn of said first conductor around said dielectric means, the other end of said first conductor being adjacent said outer conductor; a second conductor connected at one end to the end of center conductor and extending in the one direction helically around said dielectric means from the center position to a second end position; and a third conductor connected at one end to the end of said outer conductor and extending in the opposite direction helically around said dielectric means from the center position to the second end position, said second conductor overlapping said third conductor twice during each turn of said second conductor around said dielectric means, the other end of said third conductor being adjacent the other end of said second conductor;

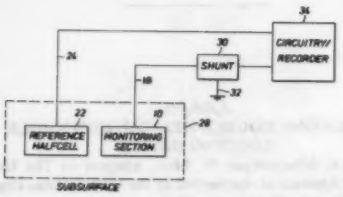
insulating means for preventing electrical contact between overlapping electrical conductors; and

a hollow dielectric housing means for enclosing and protecting the coil from a downhole environment.

4,489,277
CATHODIC PROTECTION MONITORING SYSTEM

Alvin D. Goolsby, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 4, 1982, Ser. No. 336,666
Int. Cl.³ G01N 27/42
U.S. Cl. 324—425 2 Claims

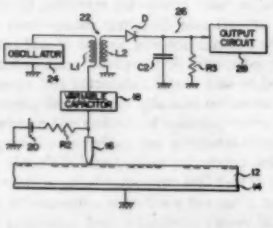


1. An apparatus for monitoring a cathodic protection system on a structure which is positioned in water such that a portion of said structure is beneath the surface of said water, comprising: an insulating means positioned adjacent to said structure below the surface of said water; a metallic body positioned adjacent to said insulating means so that said body is electrically insulated from said structure; means for electrically connecting said body of said structure at a point above the surface of said water; means for measuring the amount of current flowing through said electrical connecting means; a half cell positioned near said body; means connected to said body and said half cell for measuring the voltage difference across said body and said half cell; and means connected to said current measuring means for determining the current density on said body.

4,489,278
ELECTROSTATIC VOLTAGE DETECTING DEVICE

Norikazu Sawazaki, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 3, 1982, Ser. No. 384,605
Int. Cl.³ G11B 11/06
U.S. Cl. 324—457 5 Claims



1. An electrostatic voltage detecting device comprising:

detecting means provided with a semiconductor member arranged movably along the surface of a recording medium to detect electrostatic voltage generated by the surface charge of said recording medium, and a metal electrode connected to part of said semiconductor member to form a depletion layer in the semiconductor member, the width of the depletion layer changing in accordance with a voltage detected by the semiconductor member;

first inductance means connected to the metal electrode and combined with said detecting means to form a resonance circuit whose resonance frequency changes in accordance with the width of the depletion layer formed in said semiconductor member;

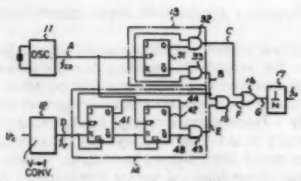
signal generating means including second and third inductance means inductively coupled with the first inductance means, an oscillating circuit for supplying an oscillating output signal of predetermined frequency to the second inductance means, and a detector circuit connected to the third inductance means to detect a voltage signal excited through the third inductance means; and

bias means for applying a DC bias voltage to the semiconductor member through the metal electrode and the first inductance means, the DC bias voltage being superposed on a voltage detected by the semiconductor member to determine the width of the depletion layer formed in said semiconductor member.

4,489,279
VARIABLE-FREQUENCY OSCILLATOR HAVING A CRYSTAL OSCILLATOR

Kazuo Kuroki Tokyo, Japan, assignor to Fuji Electric Company, Ltd., Kawasaki, Japan

Filed Sep. 1, 1982, Ser. No. 413,775
Claims priority, application Japan, Oct. 20, 1981, 56-167618
Int. Cl.³ H03K 3/72, 3/037; H03L 7/18
U.S. Cl. 328—134 3 Claims



1. A variable-frequency oscillator circuit comprising: a reference oscillator providing a reference pulse signal at a frequency fc; voltage-to-frequency converter means responsive to a control voltage for providing a control pulse signal at a frequency fv substantially lower than fc, first logic means responsive to the reference signal for providing first and second pulse signals each having frequency fc/2 and each being the complement of the other; second logic means responsive to the control signal, the reference signal and the first signal for providing a third pulse signal having a frequency substantially equal to fv and a pulse-width substantially equal to 1/fc, and synchronized with the first and second signals; third logic means responsive to the first, second and third signals for providing a fourth pulse signal which is substantially the same as the second signal but having a pulse periodically added at intervals of 1/fv; and frequency divider means responsive to the fourth signal for dividing the frequency of the fourth signal by an integral amount to provide an output signal of a desired frequency.

4,489,280
SIGNAL HARMONIC PROCESSOR

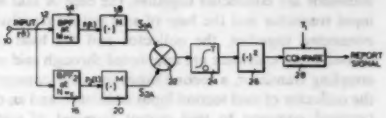
Clarence L. Bennett, Jr., Groton, and Robert D. Short, III, Littleton, both of Mass., assignors to Sperry Corporation, New York, N.Y.

Filed Jul. 15, 1982, Ser. No. 398,527
Int. Cl.³ H03B 1/00; H03K 9/06, 5/22
U.S. Cl. 328—139 18 Claims

1. A method for detecting, in an incoming signal, the common presence of a first signal of frequency ωM and a second signal pf frequency ωN related by a known rational number M/N comprising

(a) filtering the incoming signal to extract said first signal;

(b) raising said first signal to the N^{th} power, thereby providing a first raised signal;
(c) filtering the incoming signal to extract said second signal;
(d) raising said second signal to the M^{th} power, thereby providing a second raised signal;
(e) correlating the first raised signal with the second raised signal, thereby producing a correlated signal;



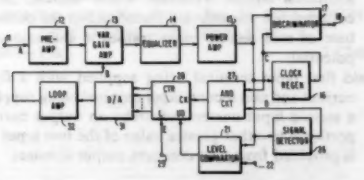
(f) detecting the energy of said correlated signal, thereby providing a detected signal; and
(g) producing a report signal, indicating the common presence of said first and second signals, when the energy of said correlated signal exceeds a predetermined level.

4,489,281

AUTOMATIC GAIN CONTROL AMPLIFIER LEFT AT AN OPTIMUM GAIN AFTER AN END OF A DIGITAL INPUT SIGNAL

Mikio Kiyono, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1983, Ser. No. 480,613
Claims priority, application Japan, Mar. 30, 1982, 57-51588
Int. Cl.³ H03G *3/20*
U.S. Cl. 330—129 **5 Claims**



1. An automatic gain control amplifier circuit for an intermittent sequence of digital input signals, comprising variable gain amplifying means responsive to a gain control signal for amplifying each digital input signal to produce a digital output signal and control signal producing means responsive to said digital output signal for producing said gain control signal, wherein said control signal producing means comprises:

first means responsive to said digital output signal for detecting presence and absence of the digital input signal in said intermittent sequence to produce a presence signal which takes a presence and an absence level when the digital input signal is present and absent in said intermittent sequence, respectively; and

second means responsive to said digital output signal and said presence signal for producing said gain control signal when said presence signal takes said presence level, said second means making said gain control signal keep a specific value while said presence signal takes said absence level, said specific value being had by said gain control signal at a instant at which said presence signal is switched from said presence level to said absence level;

wherein said first means comprises a signal detector responsive to said digital output signal and producing a presence signal having a presence level concurrent with a sequence of digital input signals and an absence level whenever there is no digital input signal;

a clock regenerator responsive to said digital output signal for regenerating a clock sequence of clocks of the digital input signal amplified into said digital output signal;

counter means responsive to said digital output signal and said presence signal for counting the clocks of said clock sequence in consideration of an amplified level taken by said digital output signal to produce a count signal when said presence signal takes said presence level, said counter means holding a specific count while said presence signal takes said absence level, said specific count being a count to which the clocks of said clock sequence are counted when said presence signal is switched from said presence level to said absence level; and

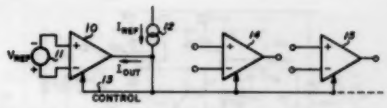
means responsive to said count signal for producing said gain control signal.

4,489,282

CMOS OP AMP BIAS CIRCUIT

William B. Jett, Jr., San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Mar. 4, 1983, Ser. No. 472,302
Int. Cl.³ H03F *3/45*
U.S. Cl. 330—261 **8 Claims**



1. A programmed differential operational amplifier circuit having a pair of input terminals and an output terminal, said circuit comprising:

means for generating a reference current;

means for applying an offset potential between said pair of input terminals whereby an output current is created;

means for comparing said reference current with said output current; and

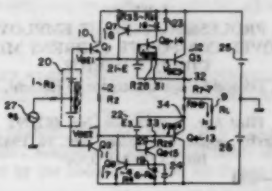
means responsive to said comparing to adjust the transconductance of said amplifier to where said output current equals said reference current whereby said amplifier has a transconductance equal to said reference current divided by said offset potential.

4,489,283

POWER AMPLIFIER

Yasuhiro Ishizaki, Kohriyama, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 28, 1982, Ser. No. 343,769
Claims priority, application Japan, Feb. 13, 1981, 56-19700
Int. Cl.³ H03F *3/30*
U.S. Cl. 330—268 **18 Claims**



1. A power amplifer for amplifying a signal fed from a signal source by a power amplification, having a pair of power amplifying elements each having an input terminal and an output terminal, which divides said signal into a positive half cycle and a negative half cycle, wherein said power amplifier comprises:

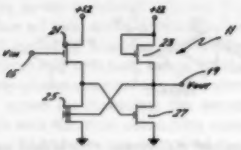
a pair of impedance elements connected in series between said output terminals of said power amplifying elements;
a load connected between the serial connected point of said impedance elements and the earth;
a fixed bias device connected to said signal source and said power amplifying elements for feeding idling current to said power amplifying elements; and
a variable bias circuit connected to said input terminals and said output terminals of each of said power amplifying elements for detecting voltage variation, between said input terminals and said output terminals of said power amplifying elements produced by current variations of said power amplifying element and for applying a bias voltage corresponding to the voltage variation to said input terminal of said power amplifying element.

4,489,284

OPERATIONAL AMPLIFIER CIRCUIT FOR NMOS CHIP

Albert J. Charpentier, 1945 Stewart Dr., Hatfield, Pa. 19440, and James W. Redfield, 1697 Karen Dr., Pottstown, Pa. 19464

Filed Jan. 3, 1983, Ser. No. 455,048
Int. Cl.³ H03F 3/16
U.S. Cl. 330—277 **6 Claims**



1. An operational amplifier circuit for high density LSI solid state circuits, having an input and output terminals, comprising:
first silicon circuit means for achieving a relatively high virtual ground level;
second silicon circuit means for amplifying said first silicon circuit means output, said second silicon circuit means being connected to said first silicon circuit means and to said output terminal;
third silicon circuit means for maintaining said second silicon circuit means output high, said third silicon circuit means being connected thereto; and
fourth silicon circuit means being connected to said second silicon circuit means output and said first silicon circuit means output for providing a positive feedback path and for continuously conducting and thereby depleting the signal on said first silicon circuit output and prohibiting a latched state of said second and third silicon circuit means at said output terminal.

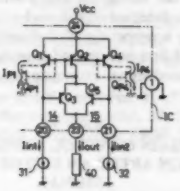
4,489,285

SIGNAL PROCESSING CIRCUIT EMPLOYING AN IMPROVED COMPOSITE CURRENT MIRROR CIRCUIT/DEVICE

Tetsuo Sato, Takasaki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 7, 1983, Ser. No. 482,792
Claims priority, application Japan, Apr. 16, 1982, 57-62438
Int. Cl.³ H03F 3/04
U.S. Cl. 330—288 **17 Claims**

1. An electric circuit comprising:
(a) a first current mirror circuit having a first input bipolar transistor, a first coupling bipolar transistor and an output bipolar transistor, wherein the emitter of said first input transistor and the emitter of said output transistor are connected together, the base of said first input transistor and the base of said output transistor are connected together, the collector and the base of said first input transistor are connected through said first coupling transistor, a first input terminal connected to the collector of said first input transistor, and an output terminal connected to the collector of said output transistor; and
(b) a second current mirror circuit having a second input bipolar transistor, a second coupling bipolar transistor, and said output transistor, wherein the emitter of said second input transistor and the emitter of said output transistor are connected together, the base of said second input transistor and the base of said output transistor are connected together, the collector and the base of said second input transistor are connected through said second coupling transistor, a second input terminal connected to the collector of said second input transistor, and an output terminal common to said output terminal of said first current mirror circuit;



said first current mirror circuit further having a first additional bipolar transistor whose emitter, base and collector are respectively connected to the collector and base of said first input transistor and a reference potential, while said second current mirror circuit further has a second additional bipolar transistor whose emitter, base and a collector are respectively connected to the collector and base of said second input transistor and said reference potential;
said first input terminal being supplied with a first input current and said second input terminal being supplied with a second input current, whereby an output current proportional to either greater value of the two input currents is provided from said common output terminal.

4,489,286

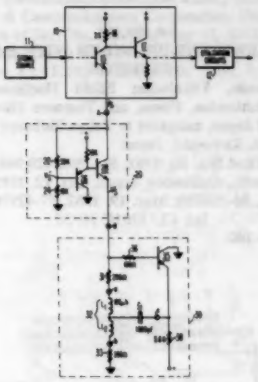
INDUCTIVE ELECTRICAL SIGNAL FILTER WITH REDUCED IMPEDANCE

Saiprasad V. Naimpally, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 29, 1983, Ser. No. 479,984
Int. Cl.³ H03F 3/191
U.S. Cl. 330—303 **18 Claims**

1. A circuit for coupling a second filter to a circuit point in a signal processing path as a substitute for a first filter directly connected to said circuit point and having the same transfer function as said second filter but with an input impedance related to the input impedance of said second filter by a proportional factor N, where N is other than one, comprising:
an amplifier with substantially unity current gain and a voltage gain of 1/N between an input and an output thereof, said input being coupled to said circuit point in said signal path, and said output being coupled to said

second filter for providing thereto a version of signals conducted by said signal path so that signals conducted by



said signal path are filtered in accordance with the transfer function of said second filter.

4,489,287

PHASE SYNCHRONIZING CIRCUIT FOR DIGITAL DATA REPRODUCTION

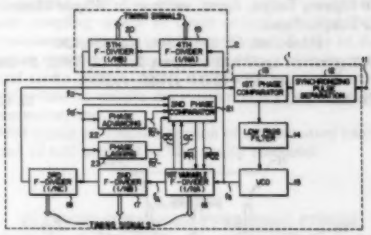
Masahide Nagumo, Kawasaki, and Tadashi Kojima, Yokosuka, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Dec. 15, 1981, Ser. No. 331,076

Claims priority, application Japan, Jan. 14, 1981, 56-4334

Int. Cl.³ H03L 7/22; H04N 5/95

U.S. Cl. 331—1 A **2 Claims**



1. A phase synchronizing circuit coupled to a predetermined input signal and including a phase locked loop, said circuit comprising:

a first phase comparison circuit having two inputs one of which is said predetermined input signal,

a voltage controlled oscillator (VCO) coupled to said first phase comparison circuit for producing an oscillating output the frequency of which is controlled by the output of said first phase comparison circuit,

first frequency dividing means having a first frequency divider to divide the output frequency of said VCO and having as outputs a first clock signal and a synchronizing signal derived from said first clock signal, said synchronizing signal serving as the other input to said first phase comparison circuit,

second frequency dividing means for dividing the output frequency of said VCO to obtain a second clock signal, and

a second phase comparison circuit receiving, as inputs, said first clock signal from said first frequency dividing means and said second clock signal from said second frequency dividing means to compare phases of said first and second clock signals, said second phase comparison circuit further including frequency dividing ratio controlling means for controlling said first frequency divider and said second phase comparison circuit such that the frequency dividing ratio of said first divider is changed to one of three ratios of 1/N, 1/(N+1) and 1/{(N+(N+1))/2}, where N is a positive integer, according to the phase difference between said first and second clock signals so as to synchronize the phases of said first and second clock signals with said input signal.

4,489,288

HIGH FREQUENCY PULSE GENERATING CIRCUIT

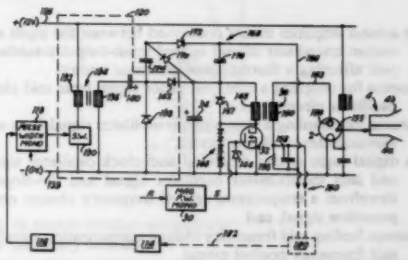
John French, Lowestoft, England, assignor to Mars, Limited, Slough, England

Filed Dec. 29, 1981, Ser. No. 335,369

Claims priority, application United Kingdom, Dec. 31, 1980, 8041592

Int. Cl.³ H03B 9/10

U.S. Cl. 331—87 **9 Claims**



1. A circuit for generating high frequency output pulses comprising a magnetron having input terminals, a pulse transformer having primary and secondary windings, the secondary winding being coupled to the magnetron input terminals to apply firing pulses thereto, capacitive charge storage means arranged for direct discharge through the primary winding of the pulse transformer, a semiconductor switching device having output terminals which are connected in series with said primary winding and having a control terminal, and a control circuit adapted to deliver to said control terminal pulses of predetermined length, the semiconductor switching device being responsive to a said pulse at its control terminal to conduct and discharge the charge storage means through the primary winding of the pulse transformer for a period determined by the length of said pulse whereby a firing pulse and a resulting high frequency output pulse are generated which have pulse lengths also determined by the length of said pulse.

4,489,289

SAW OSCILLATOR WITH DIGITAL COMPENSATION FOR TEMPERATURE RELATED FREQUENCY CHANGES

Andrew J. Slobodnik, Malden, Mass., and Roger D. Colvin, Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 8, 1982, Ser. No. 366,746

Int. Cl.³ H03H 9/25; H03B 5/32; H03L 1/02

U.S. Cl. 331—107 A **15 Claims**

1. A frequency stable digitally compensated SAW oscillator comprising

an acoustic wave device substrate having a SAW propagation surface,

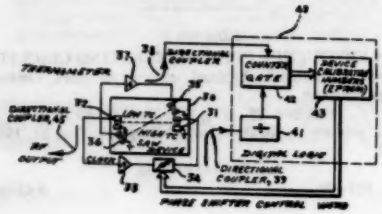
a first input-output transducer pair operably engaged to said

SAW propagating surface and aligned to establish a clock ,ircuit delay path having a low substrate temperature coefficient of delay orientation,

a first amplifier means connected between the input and output transducers of said first input-output transducer pair effecting a clock oscillator circuit,

a frequency control means in said clock oscillator circuit,

a second input-output transducer pair operably engaged to said SAW propagating surface and aligned to establish a thermometer circuit delay path having a high substrate temperature coefficient of delay orientation,



a second amplifier means connected between the input and output transducer of said second input-output transducer pair effecting a thermometer oscillator circuit,

means for coupling a clock oscillator signal from said clock oscillator circuit,

means for coupling a thermometer oscillator signal from said thermometer oscillator circuit,

a digital logic circuit receiving said clock oscillator signal and said thermometer oscillator signal and developing therefrom a temperature related frequency change compensation signal, and

means feeding said frequency change compensation signal to said frequency control means.

4,489,290

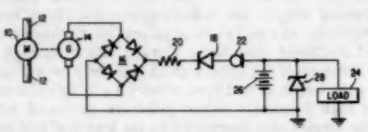
CIRCUITRY FOR CONTROLLING THE REFLECTED TORQUE ON A GENERATOR DRIVEN BY A FLUID METER

Richard C. Warner, Morris Plains, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Feb. 25, 1983, Ser. No. 469,559

Int. Cl.³ H02J 7/00; H02P 9/00

U.S. Cl. 322—35 **7 Claims**



1. In combination with a fluid meter having a rotating output shaft coupled to drive an electrical generator, an arrangement for coupling the output of the generator to a load so that the generator is prevented from supplying output current at speeds of said output shaft below a predetermined threshold speed in order to limit the loading forces applied to said output shaft at those lower speeds, said arrangement comprising:

rectifier means for rectifying alternating current to direct current, said rectifier means having an input and an output;

means for connecting said rectifier means input to the output of said generator;

threshold means connected to said rectifier means output for preventing the flow of current of said load when the voltage level at said rectifier means output is below a predetermined threshold voltage; and

current limiting means coupled between said rectifier means output and said load for preventing the current flowing from said rectifier means output to said load from exceeding a predetermined limit value.

4,489,291

CIRCUIT BREAKER PROVIDED WITH PARALLEL RESISTOR

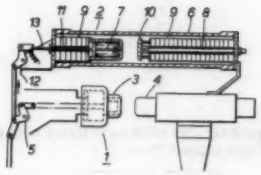
Mitsuru Toyoda, Yokohama; Eiichi Haginomori, Tokyo; Masanori Ishimatsu, Fuusa, and Tsutomu Okutomi, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 30, 1982, Ser. No. 428,968

Claims priority, application Japan, Oct. 12, 1981, 56-160954; Dec. 28, 1981, 56-210039; Mar. 19, 1982, 57-42974

Int. Cl.³ H01C 10/50

U.S. Cl. 338—200 **4 Claims**



1. A circuit breaker fitted with a parallel resistor and provided with main contacts and resistor contacts that are arranged electrically in parallel with the said main contacts, comprising:

said resistor including at least one of NiO and MgO present in an amount of at least 30 wt %.

4,489,292

STUB TYPE BANDPASS FILTER

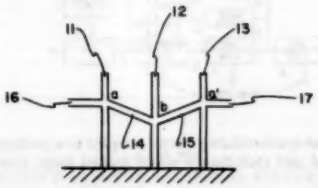
Hiroshi Ogawa, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 10, 1983, Ser. No. 456,620

Claims priority, application Japan, Jan. 22, 1982, 57-9389

Int. Cl.³ H01P 1/203, 1/201

U.S. Cl. 333—202 **11 Claims**



3. A filter for passing a band of frequencies while suppressing higher harmonics of the center frequency of said pass band, said filter comprising a transmission line having three stubs sequential connected thereto at intervals which are a uniform fraction of said center frequency, each of said stubs being a quarter wave length long and having a grounded end and an open end, the stubs in the first and last positions of said sequence being connected to said line at first locations which are first fraction of the wave length of said center frequency, and the stub in the center position of said sequence being connected to said line at a second location which is another fraction of said center frequency, each of said locations being a distance measured along the length of said stub beginning at the grounded end.

4,489,293

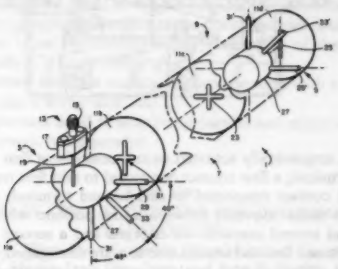
MINIATURE DUAL-MODE, DIELECTRIC-LOADED CAVITY FILTER

Slawomir J. Fiedziuszko, Palo Alto, Calif., assignor to Ford Aerospace & Communications Corporation, Detroit, Mich.

Continuation of Ser. No. 262,580, May 11, 1981, abandoned. This application Feb. 14, 1983, Ser. No. 466,180

Int. Cl.³ H01P 1/207, 1/208, 7/06, 7/10

U.S. Cl. 333—202 14 Claims



1. A miniaturized microwave filter comprising in combination:

a first composite microwave resonator comprising a cavity resonator and, disposed within said cavity resonator, a dielectric resonator element made of a material having a high dielectric constant ϵ and a high Q, said resonator element having a self-resonant frequency, the dimensions of said cavity resonator being selected so as to cause said composite resonator to have a first order resonance at a frequency near said self-resonant frequency;

first tuning means to tune said composite resonator to resonance at a first frequency along a first axis;

second tuning means to tune said composite resonator to resonance at a second frequency along a second axis orthogonal to said first axis;

mode coupling means to cause mutual coupling between resonant energy on said first and second axes to thereby cause resonant energy on either of said axes to couple to and excite resonant energy on the other of said axes;

input means to couple microwave energy into said cavity resonator; and

output means to couple a portion of said resonant energy on one of said axes out of said cavity resonator.

4,489,294

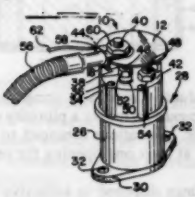
STARTER SOLENOID TERMINAL COVER

Robert W. Sanderson, III, Lombard, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Aug. 9, 1982, Ser. No. 406,662

Int. Cl.³ H01F 7/00

U.S. Cl. 335—209 7 Claims



1. Insulating end cover for the terminaled end of starter solenoids and like devices, said cover being formed of a thin flexible sheet of readily bendable and deflectable insulation having a major face portion of the cover adapted to overlie the terminaled end of the device, a depressed portion in the periphery of the face portion having a main terminal opening in the floor of the depressed portion, and a wall of generally U-shape providing offset of the face portion from the floor and integrally joining together the face and depressed portions.

4,489,295

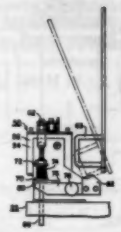
CIRCUIT INTERRUPTER WITH IMPROVED ELECTRO-MECHANICAL UNDERVOLTAGE RELEASE MECHANISM

James N. Altenhof, Jr., West Bridgewater; Jere L. McKee, Scott Township, Lawrence County, and William E. Beatty, Jr., New Swickley Township, Beaver County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 17, 1982, Ser. No. 450,857

Int. Cl.³ H01H 83/00

U.S. Cl. 335—20 14 Claims



6. A circuit breaker comprising:

a stationary contact;

a movable contact associated with said stationary contact and operable between open and closed positions with respect thereto;

movement effecting means for effecting movement of said movable contact between said open and closed positions, said movement effecting means including a releasable trip member release of which effects operation of said movable contact from closed to open position; and

resettable undervoltage release means cooperable with said movement effecting means for effecting movement of said movable contact from said closed position to said open position upon the occurrence of voltage levels less than a predetermined value, said undervoltage release means comprising:

pivotable releasable latching means cooperating with said trip member for releasing said trip member;

a hollow coil electrically energized;

a reciprocably movable armature disposed within said coil and capable of being in first and second positions, said armature being biased in said second position, said coil holding said armature in said first position when said voltage level exceeds said predetermined value;

a pivotal connecting rod connected to said armature;

a reciprocating release pin secured to said connecting rod and capable of being in a first position spaced-apart from said latching means when said armature is in its first position, and a second position releasing said latching means when said armature is in its second position; and

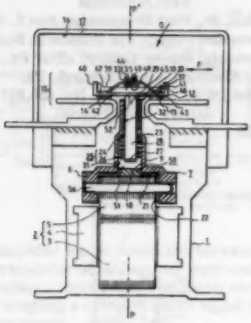
pivotal reset lever means for resetting said undervoltage release means when said movable contact operates from closed to open position;

said armature first position being vertically lower than said armature second position, and said release pin first position being vertically higher than said release pin second position.

4,489,296
DEVICE FOR RESILIENTLY HOLDING A CONTACT BRIDGE

Jean-Pierre Guéry, Poissy, and André Zwarycz, Rueil Malmaison, both of France, assignors to La Telemecanique Electrique, France

Filed Dec. 15, 1982, Ser. No. 449,904
Claims priority, application France, Dec. 15, 1981, 81 23378
Int. Cl.³ H01H 1/50
U.S. Cl. 335—197 3 Claims

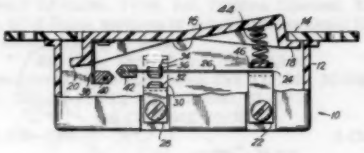


1. A device for resiliently holding a contact bridge, said device comprising: an insulating contact carrier having a base portion and at least one hollow column having a first plane of symmetry and projecting from said base portion, said column having first end portion connected to the said base portion and second free end portion; said column having an inner cavity opening at said second end portion; a bearing surface formed within the said first end portion and a contact pressure spring having first and second end turns, said pressure spring being lodged in the said inner cavity with the second end turn thereof bearing on said bearing surface; an elongate U-shaped stirrup having two substantially parallel legs symmetrically arranged with respect to said first plane of symmetry, said legs having first and second ends and a crosspiece connecting said legs at the first ends thereof, said stirrup being slidably mounted within said cavity with the second ends of its legs projecting out of said cavity and with hooked portions terminating the said second ends, said pressure spring being located between the said legs with its first end turn bearing on the said crosspiece; a generally cup-shaped elongate movable contact bridge symmetrically arranged with respect to a second plane of symmetry of the column and of the stirrup and extending in a direction substantially at right angles to the said second plane of symmetry, said contact bridge passing through the space delimited by said second end portion of the column, the second ends of the legs and the said hooked portions, said hooked portions being oriented towards each other and forming a gap therebetween in said plane of symmetry; a resilient blade symmetrically arranged with respect to the said first and second planes of symmetry and having two end portions bearing on the cup-shaped contact bridge and a central folded portion having first and second pairs of sloping sides respectively converging towards first and second junction lines in the direction of the second end portion of the column, the respective hooked portions having ribs which each engage the two respective sloping sides of the second pair and only one of the sloping sides of the first pair.

4,489,297
MAGNETIC SWITCH

Arthur W. Haydon, deceased, late of Middlebury, Conn., and by Jean F. Haydon, executor, 657 Breakneck Hill, Middlebury, Conn. 06762

Filed Mar. 15, 1982, Ser. No. 357,868
Int. Cl.³ H01H 36/00
U.S. Cl. 335—207 36 Claims

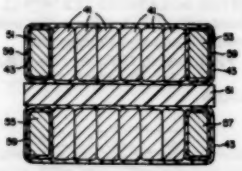


1. A magnetically actuated switch comprising first and second terminals; a first contact connected to said first terminal; a second contact connected to said second terminal; movable support means movable between a first position wherein said first and second contacts are engaged and a second position wherein said first and second contacts are disengaged; a driven magnet affixed to and movable with said movable support means; movable actuator means selectively movable between first and second positions corresponding to the first and second positions of said movable support means; and an actuator magnet affixed onto and movable with said actuator means, with said actuator magnet and said driven magnet having like poles in generally facing arrangement, said poles having wedge-shaped pole pieces with noses thereof facing one another, and disposed such that when said actuator means is in said first and second positions thereof, the actuator magnet is positioned beyond the position of said driven magnet when said support means is in its first and second positions, respectively, and when said actuator means is moved to its first and second positions, said driven magnet is repulsed by said actuator magnet to drive said movable support means to its respective second and first positions.

4,489,298
INSULATING STRUCTURE FOR MAGNETIC COILS

Gary M. Hall, Farmland, Ind., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 354,868, Mar. 4, 1982, abandoned. This application Oct. 7, 1983, Ser. No. 540,100
Int. Cl.³ H01F 27/32
U.S. Cl. 336—70 3 Claims



1. Electrical inductive apparatus comprising:
magnetic core means including a plurality of stacks of superposed metallic laminations arranged to form a magnetic circuit about at least one opening for receiving electrical windings;
electrical windings disposed in inductive relation with the magnetic core means, extending through said at least one opening, and including a plurality of pancake coils;
each pancake coil comprising an outer layer and a plurality of inner layers formed by spirally winding an elongated conductor;

the elongated conductor having a plurality of strands forming a row of strands in each layer including an end strand at each end of a row;

the end strands in each row being enclosed in dielectric covers;

each layer being encased in a dielectric casing, whereby the end strands of each layer are more heavily insulated to prevent an electrical breakdown between the corresponding end strands of adjacent layers;

each end strand having reduced width and thickness dimensions by sizes equal to the thickness of the dielectric covers so that the dimensions of the combined end strand and cover equal the corresponding dimensions of the other strands in a given row;

each strand having a rectangular cross-section with a major axis and a minor axis; and

all major axes of all strands being parallel and minor axes of all strands being parallel.

4,489,299

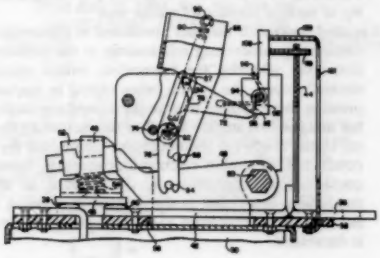
SECONDARY CIRCUIT BREAKER FOR DISTRIBUTION TRANSFORMER

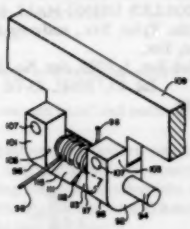
Raymond E. Wien, Penn Township, West Moreland County, Pa.; Jack G. Hanks, Iowa City, Iowa, and John F. Cotton, Athens, Ga., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 28, 1983, Ser. No. 461,795

Int. Cl.³ H01H *73/48, 75/00, 77/00*

U.S. Cl. 337—70 **6 Claims**





1. A circuit interrupter comprising:

(a) relatively movable contact structure and contact arm for moving contacts between open and closed positions;

(b) operating means including an overcenter toggle and releasable arm operable to effect movement of the movable contact structure;

(c) lever means operatively connected to the overcenter toggle for moving the operating means between open and closed positions;

(d) the releasable arm being movable from a latched position to effect opening of the contacts;

(e) a latch lever movable between latched and unlatched positions of the releasable arm and being biased in the latched position of the releasable arm;

(f) trip means operable upon overload current conditions to initiate release of the latch lever;

(g) the latch lever being the only part operatively connected between the trip means and the releasable arm, and including a cam surface for latching and unlatching the releasable arm;

(h) the cam surface having at least two release edges for the arm; and

(i) means for moving the latch lever laterally of the plane of movement of the arm so as to place a specific release edge in operating position with the arm, whereby the rating of the interrupter is changed.

4,489,300

FUSE HOLDER FOR USE WITH DIFFERENT LINE VOLTAGES

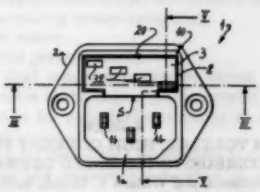
Peter Hollenstein, Kriens, and Alois Lindenmann, Luzern, both of Switzerland, assignors to Schurter AG, Luzern, Switzerland

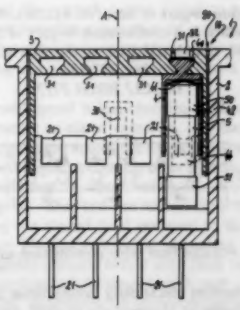
Filed Nov. 28, 1983, Ser. No. 555,593

Claims priority, application Switzerland, Dec. 14, 1982, 7263/82

Int. Cl.³ H01H *85/02, 85/20*

U.S. Cl. 337—186 **14 Claims**





1. A fuse holder for use with different line voltages and including a line voltage indicator, said fuse holder comprising:

a socket member made of electrically insulating material and comprising an outer end provided with an opening;

said socket member containing a primary connection tab and a predetermined number of secondary lateral connection tabs each of which is located in a predetermined position;

a head member removably insertable along an insertion axis into said opening and made of electrically insulating material;

said head member being insertable along said insertion axis into said opening in a predetermined orientation to assume a locked position;

a selector insert removably insertable into said head member for voltage selection in one of a number of preselectable positions, each of which corresponds to a preselected line voltage;

said selector insert containing a connecting conductor which defines a contact section and a connecting conductor finger;

a fuse comprising an electrically conductive cap member at each one of its two ends and being insertable into said selector insert substantially parallel to said insertion axis to define an outer cap member and an inner cap member;

said contact section of said connecting conductor being in electrically conductive contact with said outer cap member of said fuse when said fuse is inserted into said selector insert;

said connecting conductive finger of said connecting conductor being in electrically conductive contact with a selected one of said predetermined number of lateral connection tabs in said socket member when said selector insert including said fuse is inserted into said head member in a preselected one of said preselectable positions corresponding to said preselected line voltage and when said head member is inserted into said socket member; and

said inner cap member of said fuse being in electrically conductive contact with said primary connection tab of said socket member, when said fuse is inserted into said selector insert, when said selector insert including said fuse is inserted into said head member in said preselected position and when said head member is inserted into said socket member.

4,489,301

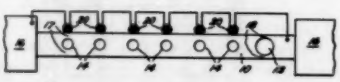
HIGH VOLTAGE, HIGH CURRENT FUSE WITH COMBUSTION ASSISTED OPERATION

Peter D. Johnson, and Willard T. Grubb, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 412,061, Aug. 27, 1982, abandoned, which is a continuation-in-part of Ser. No. 352,299, Feb. 25, 1982, abandoned. This application Mar. 7, 1983, Ser. No. 472,556

Int. Cl.³ H01H 37/76

U.S. Cl. 337—401 13 Claims



1. A high voltage fuse with combustion-assisted operation, comprising:

a fusible element electrically connectable to nonfusible external electrical connections at each end of said fusible element, said element containing at least one rapid melting portion at which melting is initiated upon passage of an electrical current through said element having a magnitude insufficient to melt the remaining portion of said fusible elements;

at least one mass of exothermic material disposed on an electrically-conductive wire, said exothermic material being disposed at selected points along the length of said fusible element, said exothermic material comprising oxidizer selected from the group consisting of chlorates and perchlorates, together with oxidizable material, said oxidizable material being selected from the group consisting of zirconium, hafnium, thorium, aluminum, magnesium, and combinations thereof; and

electric circuit connection means connecting said electrically-conductive wires to electrically opposite sides of said rapid melting portion of said fusible element.

4,489,302

ELECTRONIC PRESSURE SENSITIVE FORCE TRANSDUCER

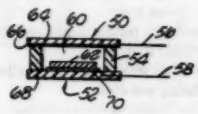
Franklin N. Eventoff, 2351 Lakeview Ave., Los Angeles, Calif. 90039

Division of Ser. No. 300,410, Sep. 8, 1981, abandoned, which is a division of Ser. No. 78,323, Sep. 24, 1979, Pat. No. 4,314,227. This application Jun. 13, 1983, Ser. No. 492,536

The portion of the term of this patent subsequent to Feb. 9, 1999, has been disclaimed.

Int. Cl.³ H01C 10/10, 10/12

U.S. Cl. 338—99 3 Claims



1. A bounceless switch apparatus having a junction resistance which varies inversely with a pressure applied normally thereto, comprising:

a first conductor member;

a pressure sensitive layer comprising a semiconducting material disposed for covering the first conductor member in intimate electrically conducting contact therewith, the pressure sensitive layer having a first surface with a multiplicity of microprotrusions of the semiconducting material extending from the first surface for providing a multiplicity of surface contact locations; and

a second conductor member positioned in substantially non-electrically conducting relationship to the pressure sensitive layer whereby the bounceless switch apparatus is normally open, the switch being closed in response to a pressing force applied to urge the second conductor member and the first surface together for increasing the physical contact between the microprotrusions and the second conductor, to enable electrical conduction through the contacting microprotrusions, the amount of electrical conduction increasing as the amount of pressing force is increased and decreasing as the amount of pressing force is decreased.

4,489,303

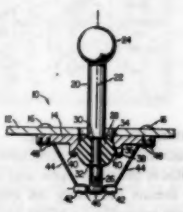
CONTACTLESS SWITCH AND JOYSTICK CONTROLLER USING HALL ELEMENTS

Thomas B. Martin, Tyler, Tex., assignor to Advanced Control Systems, Tyler, Tex.

Filed Jun. 3, 1983, Ser. No. 500,845

Int. Cl.³ H01L 43/06

U.S. Cl. 338—128 12 Claims



1. A contactless joy stick switch comprising:

a rod having a lower portion of reduced diameter;

handle means positioned at the upper end of the rod;

magnet means mounted at the lower end of the rod;

an elastomeric spring through which extends the lower portion of said rod, said spring being substantially spheri-

cal and having a downwardly facing lip extending outwardly about the circumference thereof, said spring normally positioning the rod in alignment with a predetermined axis and supporting the rod for displacement thereof out of alignment with the predetermined axis to move the magnet means in a circular pattern about the axis upon actuation of the handle means;

a frame including a plate having an aperture through which said rod extends, said aperture having a flared lower surface against which the upper surface of said spherical spring abuts;

a fastener mounted to said frame for engaging the lip of said spring and for urging said spring upwardly against the flared surface of the aperture of said frame;

a plurality of Hall effect switches;

means supporting the Hall effect switches in a circular array about the predetermined axis for actuation by the magnet means upon displacement of the rod out of alignment with the predetermined axis against the action of the spring means; and

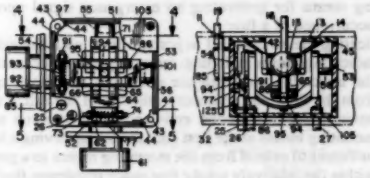
said spring means secured to said rod between the upper rod portion of larger diameter and a snap ring abutting the lower end of said spring.

4,489,304

SPRING DISCONNECT MECHANISM FOR SELF CENTERING MULTIPLE AXIS ANALOG CONTROL STICK

Charles L. Hayes, 770 Comwell Way, Vista, Calif. 92083

Filed Jul. 22, 1983, Ser. No. 516,300
Int. Cl.³ H01C *10/16*; G05G *9/00*
U.S. Cl. 338—128 **10 Claims**



1. A spring disconnect mechanism for self centering control sticks, said mechanism comprising;

a housing comprising;

a top bezel;

side panels forming a rectangular cavity with said bezel; and

a base spaced from said bezel and enclosing the interior of said cavity;

a pair of output signal varying devices, one mounted to each of two adjacent said side panels, the control shaft of each said signal varying device extending into said housing;

a control stick pivotally mounted to said bezel and extending from outside into said housing;

orthogonally arranged bail means mounted within said housing, one being connected to each said signal varying device control shaft for rotation therewith, the inner end of said control stick engaging said bails;

springs means for normally biasing each said bail to the central position; and

means for selectively engaging said spring means, said engaging means being accessible externally of said housing and being effective to selectively connect and disconnect said spring means with respect to said bails;

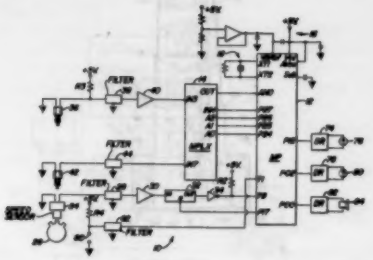
whereby said control stick may be fully biased to the center position, and may selectively be freely movable in any desired plane without being subject to any biasing forces.

4,489,305

MONITOR FOR HYDRAULIC TRANSMISSION

Stephen P. Lang, Waterloo; Yolanda E. Martin, Cedar Falls; Patrick E. Pinkston, Traer, and Kanaparty N. Rao, Cedar Falls, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed May 17, 1982, Ser. No. 379,230
Int. Cl.³ B60Q *1/00*; G08B *23/00*
U.S. Cl. 340—57 **2 Claims**



1. In an engine-driven vehicle having a hydraulic assist transmission including a control fluid circuit and a lubricating fluid circuit, a monitoring system comprising:

an engine speed sensor;

a lubricating fluid pressure sensor;

a lubricating fluid temperature sensor; stored program means responsive to the engine speed, pressure and temperature sensors for periodically executing an algorithm comprising the steps of:

(a) comparing the sensed fluid temperature to a threshold temperature and preventing generation of a warning signal if the sensed temperature is below said threshold temperature;

(b) comparing the sensed engine speed to a low speed value and preventing generation of a warning signal if the sensed speed is below said low speed value;

(c) comparing the sensed engine speed to a high speed value;

(d) if the sensed speed is less than the high speed value, then computing an alarm value, Pa, as a function of the sensed engine speed and of the sensed fluid temperature;

(e) if the sensed engine speed is greater than the high speed value, computing the alarm value, Pa, as a function of the high speed value and the sensed fluid temperature;

(f) comparing the sensed fluid pressure to the computed alarm value, Pa, and generating a warning signal if the sensed pressure remains below the alarm value, Pa, for at least a predetermined time period; and

an alarm means for generating an operator-detectable alarm signal in response to generation of the warning signal.

4,489,306

EMERGENCY SIGNAL

John E. Scolari, La Mesa, Calif., assignor to Life Light Systems, San Diego, Calif.

Continuation of Ser. No. 318,499, Nov. 5, 1981, abandoned. This application Feb. 14, 1983, Ser. No. 466,326
Int. Cl.³ B60Q *1/00*
U.S. Cl. 340—107 **22 Claims**

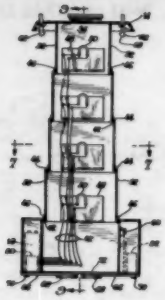
22. An emergency signal comprising:

a base;

at least two signalling means, at least one of said signalling means being in telescoping arrangement with said base, said one signalling means being adapted to be spaced from said base when in the extended mode and being adapted to be retracted into said base when in the stored mode, each

said signalling means including high intensity flash lamp means;

at least two window means, each of said window means being positioned adjacent one of said high intensity flash lamp means;



actuating means in said base electrically connecting said signalling means through switch means to battery means; whereby high intensity flashes are generated through said window means when said switch means is closed.

4,489,307

HANDLE STEM FOR A BICYCLE

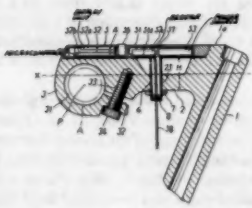
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed May 13, 1982, Ser. No. 377,802

Claims priority, application Japan, May 23, 1981, 56-74929[U]; Jun. 23, 1981, 56-93338[U]

Int. Cl.³ B60Q 1/34; G06D 1/00; H05B 37/00

U.S. Cl. 340—134 7 Claims



1. A handle stem for a bicycle comprising a stem body, a projecting portion having an elongated recessed mounting portion and extending radially outwardly of said stem body from a top thereof, a holding portion provided at a distal end of said projecting portion and having a deformable clamp defining an insertion bore for receiving a handle bar, and a display apparatus which electrically displays operating conditions of the bicycle, said display apparatus including a box member mounted in said mounting portion and containing electric parts for producing a display of at least one operating condition of a bicycle, said electric parts including a means for processing at least one signal representative of said operating condition of the bicycle and a display unit connected to said signal processing means and mounted at the surface of said box member, said display unit displaying said operating condition, said box member having an elongate shape extending longitudinally of said projecting portion and holding portion at said handle stem, said box member having at a front portion thereof said display unit and at a rear portion thereof a control unit and housing within the front portion said electric parts and within the rear portion a power source.

4,489,308

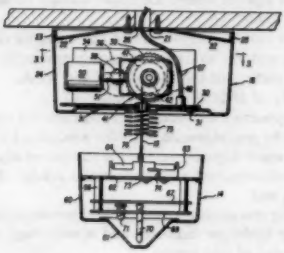
EMERGENCY EXIT INDICATORS

Emanuel L. Logan, Jr., 2301 Jefferson Davis Hwy., Arlington, Va. 22202, and J. William Walsh, 3823 Beech Ave., Baltimore, Md. 42111

Continuation-in-part of Ser. No. 244,686, Mar. 3, 1981, abandoned. This application Feb. 3, 1983, Ser. No. 463,596

Int. Cl.³ G08B 17/00, 5/38

U.S. Cl. 340—286 R 9 Claims



1. In combination with an enclosure having an emergency exit having a top and a bottom, a floor adjacent to the bottom of the exit and a ceiling adjacent to the top of the exit; a system for identifying the emergency exit in the enclosure to a person in the room when the enclosure becomes partially filled with smoke accumulated from the ceiling down to a level spaced from the floor defining a relatively smoke free space, the combination comprising:

detecting means for detecting the occurrence of a fire;

emergency signal-generating means connected to the detecting means for generating an emergency signal upon the occurrence of a fire;

indicating means installed in juxtaposition with the exit, the indicating means including: mounting means for mounting the indicating means in the enclosure at a level spaced from the floor and adjacent to the top of the exit, a tether having first and second ends and being secured to the mounting means at the first end, the tether having a length sufficient to extend from the mounting means to a position within the relatively smoke free space proximate the floor, light means attached to the tether at the position which is proximate the floor when the tether extends from the mounting means, holding means connected to the mounting means for releasably holding the light at the mounting means under normal conditions and for releasing the light from the mounting means upon occurrence of an emergency signal from the emergency signal generator, whereby the light drops into the relatively smoke free space upon the occurrence of the emergency condition so that the light is not concealed by smoke accumulated from the ceiling of the enclosure down to the relatively smoke free level.

4,489,309

PIPELINED CHARGE COUPLED TO ANALOG TO DIGITAL CONVERTER

Eugene S. Schlig, Somers, N.Y., assignor to IBM Corporation, Armonk, N.Y.

Filed Jun. 30, 1981, Ser. No. 279,118

The portion of the term of this patent subsequent to Feb. 22, 2000, has been disclaimed.

Int. Cl.³ H03K 13/08

U.S. Cl. 340—347 AD 3 Claims

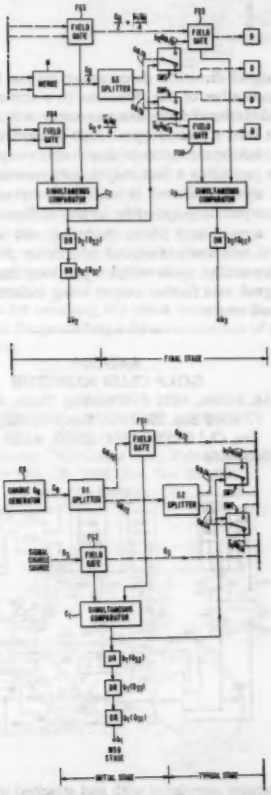
1. A charge coupled A/D system including a plurality of pipelined charge processing stages for performing successive approximations on a reference analog charge Q_r and an input signal charge Q_s wherein:

each of said pipelined charge processing stages are coupled

only to directly adjacent stages for propagation of reference and input signal charges, each said pipelined charge processing stage includes charge processing means, including comparator means, for performing an inequality function, said plurality of pipelined charge processing stages providing a bit string b_1 through b_N representing a digital representation of said input analog signal charge Q_S;

which includes a different stage for each bit, b_1 through b_N, of said digital representation an in which each stage, other than an initial and final stage comprise:

charge splitter means subjected to an input charge packet Qi for delivering, on separate charge transfer paths, a pair of charge packets Qi/2;



a pair of commonly controlled charge switching means, each with a charge input and a pair of outputs, each said charge switching means connected to receive a one of said charge packets Qi/2;

a single electrode and means coupling an output of each of said charge switching means to said electrode;

and a pair of field gate means for generating input voltages for said comparator means each coupled to other outputs of said charge switching means;

and means for controlling said charge switching means whereby a charge packet Qi/2 is input to one or another of said field gate means regardless of a condition of said charge switching means.

4,489,310

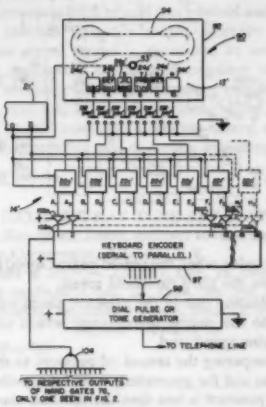
TIME SLOT-CONTROLLING CIRCUIT FOR KEYBOARD SWITCH MODULE, AND APPARATUS INCORPORATING SAME

David Trostyanetsky, Columbus, Ohio, assignor to AT&T Technologies, Inc., New York, N.Y.

Filed May 28, 1982, Ser. No. 383,079

Int. Cl.³ G06F *3/02*; H04M *1/26*

U.S. Cl. 340—365 VL **14 Claims**



1. A time slot-controlling circuit for use in increasing the number of possible operative switching states for the keys of a keyboard switch module, said circuit comprising:

first means, when voltage biased, for generating at least two repetitive and alternating time slot-controlling signals, each of which is of predetermined duration and logic state, and defines a separate time slot period, and

second means, including a plurality of channel selector circuit means, each of the latter means producing an output utilization control signal on a time slot associated one of two output channels thereof in response at least conditionally to both a selected one of said time slot-controlling signals and a Clock-defining signal being applied thereto, the latter signal being generated by said second means, and initiated by a pre-selected key switch of an associated keyboard, when such a key switch is responsively connected to an associated one of said channel selector circuit means, and actuated during a selected time slot period, each resulting channel output control signal thereby being representative of an exclusive one of at least two distinct actuated-key switching states, and of any visually discernable characters pre-assigned to such an exclusive switching state.

4,489,311

ENGINE OIL PRESSURE MONITOR

Stephen P. Lang, Waterloo; Yolanda E. Martin, Cedar Falls, and Richard G. Norton, Hudson, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed May 17, 1982, Ser. No. 378,704

Int. Cl.³ G08B *23/00*; B60Q *1/00*

U.S. Cl. 340—501 **3 Claims**

1. An engine oil pressure monitor comprising:

means for sensing engine speed;

means for sensing engine oil pressure;

means for preventing generation of a warning signal when the sensed engine speed is less than non-zero first threshold speed;

means for generating a first predetermined constant pressure alarm value when the sensed engine speed is in a first

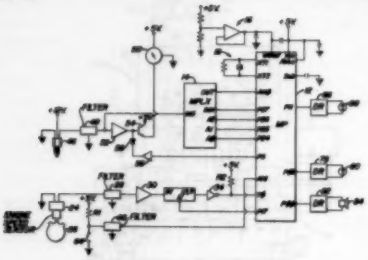
range above the first threshold speed and below a second threshold speed;

means for generating a variable pressure alarm value which is proportional to sensed engine speed when the sensed engine speed is in a second range above the second threshold speed and below a third threshold speed;

means for generating a second predetermined constant pressure alarm value when the sensed engine speed is in a third range above the third threshold speed;

means for selecting one of the pressure alarm values corresponding to the engine speed range which contains the sensed engine speed; and

means for comparing the sensed oil pressure to the selected alarm value and for generating warning signals when the sensed oil pressure is less than the selected alarm value.

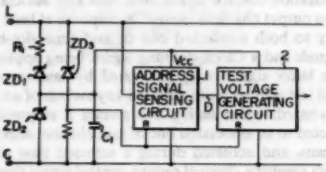


4,489,312

SELECTIVE TEST CIRCUIT FOR FIRE DETECTORS

Yukio Yoshizaki, Tokyo, Japan, assignor to Nittan Company, Limited, Tokyo, Japan

Filed Apr. 14, 1982, Ser. No. 368,224
Claims priority, application Japan, Apr. 15, 1981, 56-55534
Int. Cl.³ G08B 29/00
U.S. Cl. 340—514 4 Claims



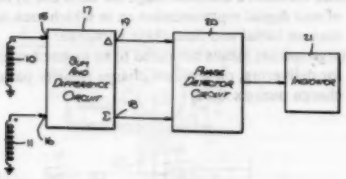
1. A circuit for selectively testing detectors connected between one of a plurality of alarming lines each extending from a section relay of a receiving unit and a common line comprising: an address-signal-sensing circuit for producing a coincidence signal when coincidence is sensed between an address signal transmitted through the alarming line and the inherent address code allotted to each fire detector beforehand; a test-voltage-generating circuit for generating a test voltage to be applied to each fire detector in response to said coincidence signal; a serial connection of a first Zenner diode and a condenser connected between the alarming line and the common line; and means for generating a resetting signal to reset the address-signal-sensing circuit and the test-voltage-generating circuit when the alarming line voltage is in excess of a predetermined value; whereby the condenser is charged at a voltage exceeding a predetermined value and, at the same time, resets the address-signal-sensing circuit and the test-voltage-generating circuit; and the voltage charged on the condenser acts as the power source for actuating the address-signal-sensing circuit and the test-voltage-generating circuit.

4,489,313

SIGNAL DIRECTION DETERMINING SYSTEM AND DIRECTIONAL LOOP ANTENNA ARRAY THEREFOR

Henry F. Pfister, Wilton Manors, Fla., assignor to Sensormatic Electronics Corporation, Deerfield Beach, Fla.

Filed Sep. 1, 1982, Ser. No. 413,612
Int. Cl.³ G08B 21/00
U.S. Cl. 340—540 10 Claims



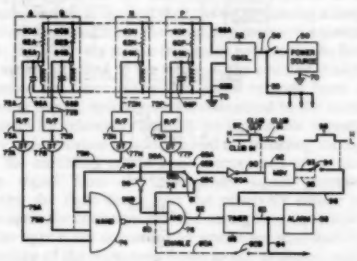
1. A signal direction determining system for providing an output indicative of the direction to a source of AC signals from a directional loop antenna array where said array includes at least a pair of open loops of electrically conductive material, said system comprising means coupled to said open loops for providing a first output corresponding to the sum of any AC signals induced in said loops by said source and a second output corresponding to the difference between said induced signals; and phase detecting and indicating means coupled to said first and second outputs for providing a further output dependent upon which open loop has the greater induced signal, said further output being indicative of the direction to said source.

4,489,314

GOLF CLUB MONITOR

Sheldon M. Miller, 4636 S. Wheeling, Tulsa, Okla. 74105

Filed Sep. 23, 1982, Ser. No. 422,269
Int. Cl.³ G08B 13/14, 23/00; A63B 55/00
U.S. Cl. 340—568 26 Claims



1. Apparatus associated with and attached to a golf club bag for monitoring the presence or absence of at least certain ones of the golf clubs carried in said golf bag, comprising:

(a) an assembly of a plurality of laterally spaced short tubular receptacles each one adapted to receive the shaft of a golf club, said assembly adapted to be supported by the open top of said golf bag;

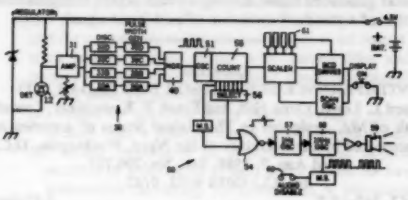
(b) first means associated with each of said tubular receptacles for sensing when the shaft of a golf club is inserted into the receptacle;

(c) second means for monitoring all of said first means, and activating an alarm when under selected conditions at least one of said clubs other than said putter is not positioned in a tubular receptacle; and wherein said alarm is enabled whenever, the putter having been outside of the bag is reinserted into the bag.

4,489,315
PERSONNEL ELECTRONIC NEUTRON DOSIMETER

Roger B. Falk, Lafayette, and William H. Tyree, Boulder, both of Colo., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 3, 1982, Ser. No. 354,419
Int. Cl.³ G01T 3/12; G08B 17/12
U.S. Cl. 340—600 4 Claims

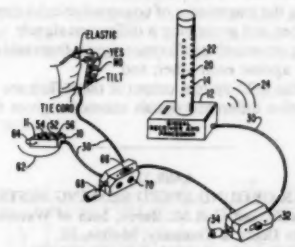


1. A personnel electronic neutron dosimeter capable of being carried on the clothing of a user comprising:
- neutron detector means for producing secondary reactions which generate an electrical signal;
- pulse generator means, connected to said detector, for generating a pulse, the duration of each pulse being controlled by the amplitude of each electrical signal;
- oscillator means, enabled by said pulse generator, for generating clock pulses, thereby providing a dose equivalent representation;
- counter means for counting the clock pulses; and
- indicator means for providing a direct indication of accumulated radiation.

4,489,316
METHOD AND APPARATUS FOR MINORITY VIEW REDUCTION

Donald R. MacQuivey, 743 Gailen Ave., Palo Alto, Calif. 94303

Filed Oct. 23, 1980, Ser. No. 200,091
Int. Cl.³ G09G 1/00
U.S. Cl. 340—700 11 Claims

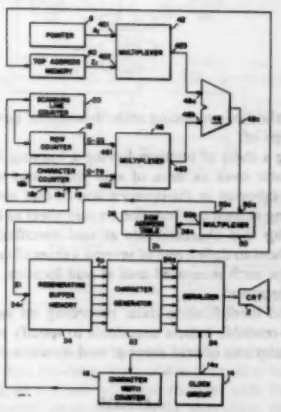


1. Apparatus for promoting consensus and teaching comprising:
- a group attitude indicator means including
  - means for registering the collective user positive responses,
  - means for registering the collective user negative responses,
  - means connected to said positive response registering means for indicating positive responses,
  - means connected to said negative response registering means for indicating negative responses,
  - means for inhibiting operation of said positive response indicating means and said negative response indicating means, and
  - means connected to said operation inhibiting means for indicating the system use is being inhibited,
- a plurality of user control assemblies, each control assembly having
  - means for producing a signal representing a positive response,
  - means for producing a signal representing a negative response, and
  - means for producing a signal representing a system inhibiting response,
- means connecting each of said user control assemblies to said group attitude indicator means whereby said positive response signal means is connected to said positive response registering means, said negative response signal means is connected to said negative response registering means, and said inhibiting response signal means is connected to said operation inhibiting means, and
- means for overriding said operation inhibiting means.

4,489,317
CATHODE RAY TUBE APPARATUS

Seiji Shiga, Kanagawa, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 216,887, Dec. 16, 1980, abandoned.
This application Jan. 25, 1984, Ser. No. 574,189
Claims priority, application Japan, Dec. 20, 1979, 54-164846
Int. Cl.³ G09G 1/16
U.S. Cl. 340—726 15 Claims



1. A cathode ray tube display apparatus comprising:
- a cathode ray tube,
- a regenerating buffer memory for storing character information, having a storage capacity greater than the display capacity of the screen of said cathode ray tube;
- a row address table having a capacity to store a larger number of addresses indicating the rows of said regenerating buffer memory than the number of rows in said screen, and storing said addresses indicating rows in desired order;
- a pointer for designating an address of said row address table to determine the storing position to be accessed;
- a row address read-out means responsive to a table address which is output from said pointer for reading the address indicating the row stored in said row address table;
- a memory read-out means for reading out from the regenerating buffer memory character information stored in the row indicated by the address which has been read out from said row address table; and
- a display means for displaying visually the character infor-

mation which has been read out from said regenerating buffer memory.

4,489,318

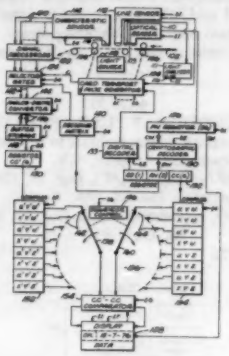
NON-COUNTERFEITABLE DOCUMENT SYSTEM

Robert N. Goldman, Kailua, Hi., assignor to Light Signatures, Inc., Los Angeles, Calif.

Division of Ser. No. 276,282, Jun. 22, 1981, Pat. No. 4,423,415, which is a continuation-in-part of Ser. No. 161,838, Jun. 23, 1980, abandoned. This application Jun. 3, 1983, Ser. No. 492,324 The portion of the term of this patent subsequent to Dec. 27, 2000, has been disclaimed.

Int. Cl.³ G06K *5/00, 7/08;* H04Q *9/00*

U.S. Cl. 340—825.34 **10 Claims**



1. A method of producing an authenticator device comprising the steps of:

selecting a sheet of medium having a varying random characteristic over an area of said sheet, said characteristic being inherent in the composition of said medium;

specifying at least one location on said sheet as location data;

measuring said characteristic at said specified location on said sheet to define one of several values of said characteristic for each measured area at said location as identification data; and

from said identification data, recording on said sheet machine-readable indicia decodable to specify said measured characteristic of said sheet at said location on said sheet.

4,489,319

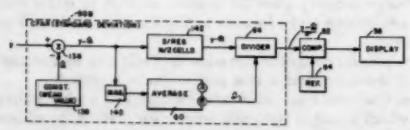
DETECTOR WITH VARIANCE SENSITIVITY

V. Gregers Hansen, Framingham, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 241,164, Mar. 6, 1981, abandoned, which is a continuation of Ser. No. 070,276, Aug. 27, 1979, abandoned. This application Apr. 8, 1983, Ser. No. 480,780

Int. Cl.³ G01S *7/30, 13/02*

U.S. Cl. 343—7 A **2 Claims**



2. An echo ranging system having means for adjusting the level of an input signal relative to a threshold level to compensate for a clutter component of said input signal comprising:

means for determining a difference between said input signal and an estimate of a mean of said input signal;

means for generating a signal having a value which is representative of a standard deviation of said input signal;

means for altering the ratio of said signal relative said threshold level by the value of said generated signal; and

said signal generating means comprising: (a) means coupled to said difference determining means for taking a magnitude of said difference; and (b) means coupling to said magnitude means for averaging a plurality of said difference magnitudes to provide to said ratio altering means said generated signal having a value which is representative of a standard deviation of said input signal.

4,489,320

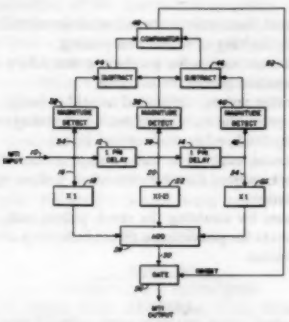
INTERFERENCE SUPPRESSOR FOR RADAR MTI

Bernard L. Lewis, Oxon Hill, and Frank F. Kretschmer, Laurel, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 7, 1981, Ser. No. 290,757

Int. Cl.³ G01S *9/02, 9/42*

U.S. Cl. 343—7.7 **4 Claims**



4. A method for suppressing impulse interference in an N-pulse Moving Target Indicator system comprising the steps of:

detecting the magnitude of successive echo return signals in an N-pulse set, where $N \geq 3$;

subtracting the magnitudes of consecutive echo signals from each other and generating a difference signal;

comparing consecutive difference signals from said subtracting step against each other; and

blocking the MTI system output if the difference between consecutive difference signals exceeds a given threshold level.

4,489,321

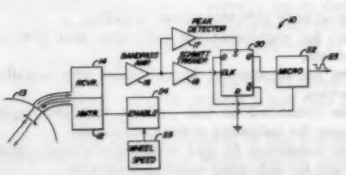
RADAR GROUND SPEED SENSING SYSTEM

Robert J. Hoffa, and Carl M. Burde, both of Waterloo, Iowa, assignors to Deere & Company, Moline, Ill.

Filed May 5, 1983, Ser. No. 491,696

Int. Cl.³ G01S *13/60*

U.S. Cl. 343—8 **11 Claims**



1. A radar speed sensing system for a vehicle moving over terrain, comprising:

means for generating high frequency electromagnetic energy and for providing a Doppler signal representative of a frequency difference between a return part of said high frequency energy and the generated energy;

directing and receiving means directing at least a portion of said generated energy along an axis intersecting with said terrain and receiving along said axis a returned part of said generated energy directed along said axis;

means for converting the Doppler signal to an input pulse train having input pulses with pulsewidths and frequency related to a ground speed of the vehicle; and

signal processing means for receiving said input pulse train and for converting said input pulse train to an output pulse train having output pulses with pulsewidths and frequency related to vehicle ground speed, the signal processing means comprising:

(a) means for ignoring input pulses having a pulsewidth greater than a predetermined threshold pulsewidth;

(b) means responsive to a predetermined consecutive number of a first kind of said input pulses, all having a pulsewidth deviating by more than a predetermined amount from a predetermined output signal pulsewidth, for generating an average input value representing an average of the pulsewidths of said predetermined number of the first kind of said input pulses;

(c) means for deriving a first output value from the average input value and a stored output signal pulsewidth value;

(d) means responsive to a second kind of said input pulses, having a pulsewidth deviating by not more than said predetermined amount from said predetermined output signal pulsewidth, for deriving a second output value from a pulsewidth value of said second kind of said input pulses and from a stored output signal pulsewidth value; and

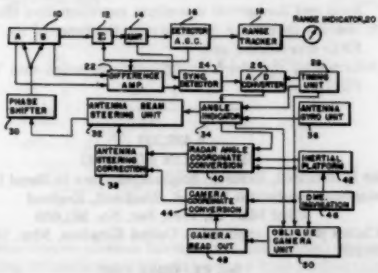
(e) means for generating the output signal pulse train as a function of the first and second output values, the output pulse train having output pulses with pulsewidths and frequency related to the first and second output values and to the vehicle ground speed.

4,489,322

RADAR CALIBRATION USING DIRECT MEASUREMENT EQUIPMENT AND OBLIQUE PHOTOMETRY

Donald I. Zuich, Oneida, and Robert H. Brock, Jr., Marcellus, both of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 27, 1983, Ser. No. 461,427
Int. Cl.³ G01S *7/40, 9/02*
U.S. Cl. 343—17.7 **7 Claims**



1. A radar calibration apparatus comprising in combination:

a radar unit with electronically steerable phased-array antenna to produce a radar beam, said radar unit being located on an airborne platform to observe terrain, terrain features and ground targets and to provide radar derived angle data;

means for navigation mounted on said airborne platform to provide position information and distance measurements, and

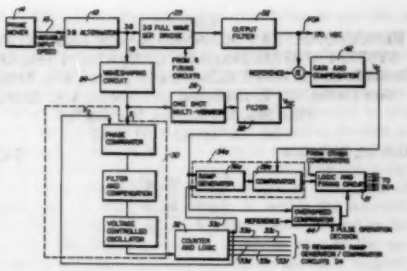
an oblique camera means located on said airborne platform to provide a first image of the field of view directly under said airborne platform and a second image of the field of view in the direction of said radar beam, said oblique camera means receiving a timing signal from said radar unit to synchronize the camera exposure to the same time as the radar angle measurement, said first and second images are scanned in said camera means to obtain angle and position measurements and of said terrain, terrain features and ground targets, said camera means receiving position information and distance measurements from said navigation means, said camera means providing an error correction signal to said radar unit to correct the difference between the radar beam angle and the camera optical angle.

4,489,323

CONTROL FOR ELECTRICAL POWER CONVERSION SYSTEM

Timothy F. Glennon; David J. Hucker, both of Rockford, Ill., and Charles M. Lenny, Billerica, Mass., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Feb. 7, 1983, Ser. No. 464,420
Int. Cl.³ H02P *13/24*
U.S. Cl. 363—87 **13 Claims**



1. In an electrical power system having an n-phase variable speed alternator, the frequency of the alternator being a function of speed, an n-phase full wave rectifier with 2n controlled rectifier elements connected with the alternator, the full wave rectifier having a DC output voltage, and a control circuit responsive to the DC output voltage of the rectifier to control the angle of conduction of the 2n rectifier elements for n-phase full wave rectification, an improved control, including:

means for sensing the speed of the alternator;

means responsive to an alternator speed exceeding a reference value for establishing an overspeed rectifier control signal; and

overspeed control means, in said control circuit, responsive to said overspeed rectifier control signal for causing said control circuit to control conduction of said rectifier elements for less than n-phase, full wave rectification.

4,489,324

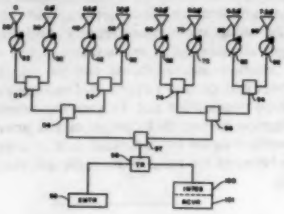
LOW SIDELOBE PHASED ARRAY ANTENNA SYSTEM

Alan E. Blume, 5866 Shady Cove, Trotwood, Ohio 45426

Filed Nov. 30, 1982, Ser. No. 445,639
Int. Cl.³ H01Q *3/22, 3/24, 3/26*
U.S. Cl. 343—372 **5 Claims**

1. In a pulse radar system having a transmitter, receiver and phased array antenna, said phased array antenna comprising:

a digital phase shifter with each of a plurality of radiating elements of said antenna in a common path of electromagnetic energy for both transmitting and receiving, said digital phase shifters set to produce a linear slope phase front in which the phase difference between adjacent elements is equal in order to orient the antenna's main beam in a given direction; said radar system further including an integration means in said receiver which sums



a sequence of radar return signals over a particular dwell time to average any received noise while enhancing the desired target signal; and

means for advancing each phase shifter setting by one bit just before each radar pulse is transmitted whereby the slope of the phase front remains constant so that the direction of the main beam remains fixed while wide angle sidelobes are reduced by the integration means.

4,489,325

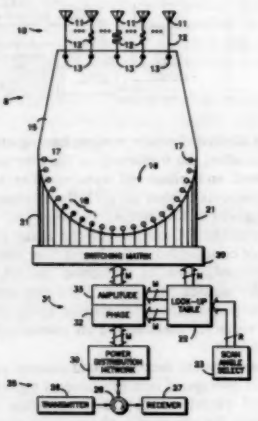
ELECTRONICALLY SCANNED SPACE FED ANTENNA SYSTEM AND METHOD OF OPERATION THEREOF

Jerald L. Bauck, 2834 S. Calle Rosa Clr., Mesa, Ariz. 85202, and Sam Daniel, 921 E. Driftwood Dr., Tempe, Ariz. 85282

Filed Sep. 2, 1983, Ser. No. 528,767

Int. Cl.³ H01Q *3/02, 3/12*

U.S. Cl. 343—374 **5 Claims**



1. A method of operating an antenna system of the type having a radiation array and a spatially separated excitation array comprising the steps of:

selecting a desired set of amplitudes and phases necessary to cause the radiation array to create a desired radiation pattern;

selecting a subset of the excitation array;

formulating a description of actual amplitudes and phases of said radiation array in terms of amplitudes and phases of said subset of said excitation array;

determining an optimum set of amplitudes and phases of said subset which minimizes a mean square error between said actual amplitudes and phases and said desired amplitudes and phases; and

controlling phase and amplitude characteristics of transmission paths between said selected subset of said excitation array and an apparatus utilizing the antenna to produce said optimum set of phases and amplitudes at said excitation array.

4,489,326

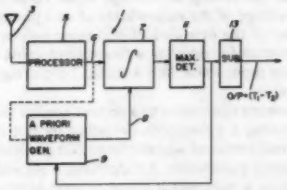
TIME REFERENCE SCANNING BEAM MICROWAVE LANDING SYSTEM

John Studenny, Montreal, Canada, assignor to Canadian Marconi Company, Montreal, Canada

Filed Mar. 15, 1982, Ser. No. 358,265

Int. Cl.³ G01S *1/16*

U.S. Cl. 343—408 **13 Claims**



1. In a method for processing TO and FRO waveforms from the time reference scanning beam of a microwave landing system, which method includes the steps of detecting said TO and FRO waveforms, further steps for determining the time interval between the TO and FRO received waveforms, said further steps comprising:

generating apriori waveforms representative, respectively, of said TO received waveform and said FRO received waveform;

performing:

a correlation process between said TO received waveform and the apriori waveform representative of said TO received waveform; and

a correlation process between said FRO received waveform and the apriori waveform representative of said FRO received waveform;

determining:

the maximum correlation between the TO received waveform and the apriori waveform representative thereof; and

the maximum correlation between the FRO received waveform and the apriori waveform representative thereof;

to thereby determine, respectively, the times of the TO and FRO waveforms; and

determining the absolute difference between said TO and FRO times.

4,489,327

DIRECTION FINDING

John R. Eastwell, Reading, England, assignor to Racal Communications Equipment Limited, Bracknell, England

Filed Mar. 23, 1982, Ser. No. 361,089

Claims priority, application United Kingdom, Mar. 24, 1981, 8109105

Int. Cl.³ G01S *5/04*

U.S. Cl. 343—432 **11 Claims**

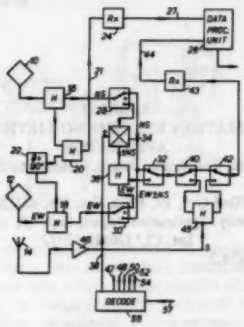
1. A direction finding system for assessing the bearing of a received radio signal, comprising

first and second fixed antenna arrangements having response patterns arranged substantially at 90° to each other and

defining a first set of perpendicular axes for receiving the said radio signal,

a single radio receiver,

signal processing means operative to produce a first output representing the radio signal as received by the first antenna arrangement during a first time period, operative to produce a second output representing the radio signal as received by the second antenna arrangement during a second time period, operative to produce a third output representing the sum of selected proportions of the first and second outputs during a third time period, and operative to produce a fourth output representing the difference



of selected proportions of the first and second outputs during a fourth time period, and

output means operative to produce the ratio of the first and second outputs to derive a first set of four bearing angle values relative to said first set of axes, and operative to produce the ratio of the third and fourth outputs to derive a second set of four bearing angle values relative to a second set of perpendicular axes shifted by a selected angle relative to said first set of axes, whereby two of the bearing angle values of the first set coincide in space with two of the bearing angle values of the second set, such that the bearing of said received radio signal is one of said coincident bearing angle values.

4,489,328

PLURAL MICROSTRIP SLOT ANTENNA

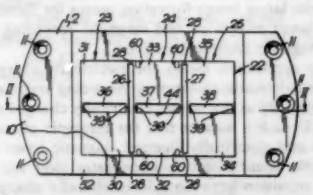
Trevor Gears, 10 Tannery Yard, Witney St., Burford, Oxfordshire OX8 4DN, England

Filed Jun. 21, 1982, Ser. No. 390,613

Claims priority, application United Kingdom, Jun. 25, 1981, 8119623

Int. Cl.³ H01Q *1/38, 13/10*

U.S. Cl. 343—700 MS **5 Claims**



1. A microwave antenna having a first microwave element comprising an insulative substrate having a front surface and a rear surface, two substantially identical planar electrically-conductive areas formed on said front surface, said conductive areas having substantially uninterrupted boundaries and being effectively electrically insulated from said rear surface, and an electrically nonconductive region extending laterally between said two areas, said nonconductive region defining a first slot by which microwave energy is propagated or received to reinforce energy propagated from or received by said conductive areas, and at least one further microwave element substantially identical to said first microwave element and separated from said first microwave element by at least one further slot arranged orthogonally of said first slot such that microwave energy is supplied between said first element and said further element via said further slot, and means for feeding said antenna with microwave energy at said first slot.

4,489,329

SENSOR RELEASE LATCH FOR SPACE VEHICLE

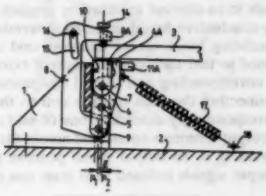
Gérard Vezain, and Jean-Claude Vermalle, both of Mandelieu, France, assignors to Societe Nationale Industrielle et Aerospatiale, Paris, France

Filed Nov. 2, 1982, Ser. No. 438,667

Claims priority, application France, Nov. 26, 1981, 81 22144

Int. Cl.³ H01Q *1/28*

U.S. Cl. 343—705 **8 Claims**



1. A holding and releasing system permitting to provide a temporary connection between a movable part and a stationary part which must be separated from one another during their specific use, more particularly, within the limits of an application to a space vehicle, comprising: several elementary devices, each being constituted by a supporting foot connected to the stationary part; a link in form of a rocker hinged to the foot at its central portion; an element in form of a movable support hinged to one end of the link; a sheaving bracket hinged to the other end of the link; said link being capable of taking one of two positions, i.e. a locking position in which the movable support comes to bear on a face of the movable part, while the other end of the sheaving bracket comes to bear on the opposed face of the movable part, opposite the movable support, thereby causing immobilization of the movable part in a very precise position, and a release position in which the movable support as well as the sheaving bracket are both in a retracted position thereby releasing the movable part of any holding stress and permitting it to oscillate; a release lever hinged to the foot and intended to block the link to the locking position; a control device to free the release lever from its blocking function; and means for automatically causing the link to pivot from the locking position to the release position.

4,489,330

ELECTROMAGNETIC INDUCTION COIL ANTENNA

Yozo Marutake, Hino; Tatsuro Fukutome, Inagi; Motomu Asami, Akishima, and Hideo Motohashi, Suginami, all of Japan, assignors to Rion Kabushiki Kaisha, Japan

Filed Sep. 22, 1982, Ser. No. 421,660

Claims priority, application Japan, Oct. 1, 1981, 56-156833

Int. Cl.³ H01Q *1/36*; H04R *25/00*

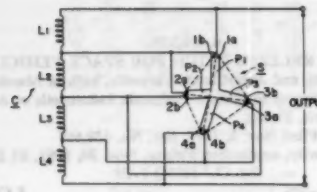
U.S. Cl. 343—742 **4 Claims**

1. An electromagnetic induction coil device for cooperating with a primary induction coil system, comprising:

an electromagnetic coil assembly including four coils each having a first end connected to the first end of each of the four coils at a center junction and a second end, each coil having the same winding direction and extending outwardly from said center junction along the lines from the

center of a regular tetrahedron to each of the four apexes thereof to be uniformly spatially arranged;

a phase selector including a regular tetrahedron shaped insulating block having four conduits cut therethrough along the lines from the center junction of the regular tetrahedron thereof to the four apexes thereof; a quantity of electrically conductive liquid within said conduits; four insulating covers sealing the ends of said conduits, each cover having two terminals therethrough to cause such



terminals to be shorted together by contact with the electrically conductive liquid when such terminals are below said insulating block center junction, said conduits being positioned so that each conduit thereof extends in parallel with a corresponding coil of said coil assembly;

means connecting the ends of each coil to the terminals of the correspondingly extending one of said conduits; and

a pair of output terminals connected across the coil assembly for providing as an output signal positive phase component output signals induced in at least one of said coils.

4,489,331

TWO-BAND MICROWAVE ANTENNA WITH NESTED HORNS FOR FEEDING A SUB AND MAIN REFLECTOR

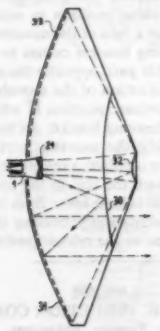
Francois Salvat; Jean Bouko, and Claude Coquio, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 21, 1982, Ser. No. 341,580

Claims priority, application France, Jan. 23, 1981, 81 01286

Int. Cl.³ H01Q *13/00, 5/00, 15/23*

U.S. Cl. 343—753 **8 Claims**



1. A two-band multimode microwave source for the simultaneous radiation of waves in a lower-frequency band and in a higher-frequency band, comprising a waveguide structure forming a first cavity of rectangular cross-section and including two first pairs of waveguides which terminate at a discontinuity plane and are separated from each other by a first block projecting convergingly beyond said discontinuity plane into said first cavity, said first pairs of waveguides emitting into said first cavity a lower-frequency first wave, said first block being hollow and containing two second pairs of waveguides separated by a second block, said first block forming a second cavity communicating with said second pairs of waveguides and opening into said first cavity for emitting a higher-frequency second wave into the latter, said first cavity having an output aperture spaced from said second cavity in the direction of wave propagation for radiating both said first and second waves.

4,489,332

INFORMATION RECORDING METHOD AND APPARATUS

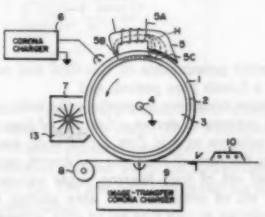
Wasaburo Ohta, Yokohama, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Oct. 19, 1982, Ser. No. 435,262

Claims priority, application Japan, Oct. 19, 1981, 56-166919

Int. Cl.³ G01D *15/12*

U.S. Cl. 346—74.2 **11 Claims**



3. An information recording apparatus for forming a magnetic latent image on a magnetic recording medium and developing said magnetic latent image to a visible image with a magnetic toner, comprising:

a toner charging means for electrically charging said magnetic toner to a predetermined polarity;

a rotatable magnetic recording medium comprising a magnetic recording layer and a support member for supporting said magnetic recording layer, which magnetic recording layer is electrically chargeable and magnetizable, allowing the formation of magnetic latent images thereon;

a closed-magnetic-field formation member with high permeability disposed under said magnetic recording layer,

a magnetic latent image formation means for forming magnetic latent images on said magnetic recording layer of said magnetic recording medium;

a charge application means for electrically charging said magnetic-latent-image-bearing recording medium to the same polarity as that of said electrically charged magnetic toner in such a manner that the magnetic attraction between said electrically charged magnetic toner and said magnetic latent images predominates over the electrostatic repulsion between said electrically charged magnetic toner and said electrically charged magnetic-latent-image-bearing recording medium;

a development means for developing said magnetic latent images to visible images by said magnetic toner;

an image transfer means for transferring said visible images from said recording medium to a recording sheet; and

an image fixing means for fixing said visible image to said recording sheet.

4,489,333
DEVICE FOR EXCHANGING OBJECTS IN PARTICULAR WRITING INSTRUMENTS

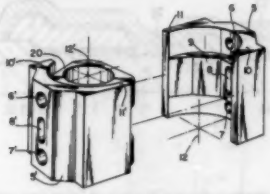
Gerold Anderka, Ellerbek; Joachim Brandt, Hamburg; Gerhard DeBlitz, Quickborn; Rolf Martens, Hamburg; Rolf Paschen, Elmshorn; Jurgen Post, Stelle, and Bernd Willimczik, Wedel, all of Fed. Rep. of Germany, assignors to Koh-I-Noor Rapidograph, Inc., Bloomsbury, N.J.

Filed Jun. 28, 1983, Ser. No. 508,683

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1982, 3226455

Int. Cl.³ G01D *15/00*

U.S. Cl. 346—139 R **14 Claims**



1. A device for exchanging objects, in particular writing instruments, between two substantially identically embodied holders open at one side, which for the transfer of an object are movable relative to one another, by means of the approach toward one another of their open sides oriented toward one another, in a plane extending substantially at right angles to their longitudinal axes, characterized in that the object is held in a receptacle (20) having an uneven number of corners and in cross section having substantially the shape of a regular, convex n-gon, which has at each corner an element of ferromagnetic material or a permanent magnet, all of which are located at the same level; that each holder has in the receiving area on the inner face disposed opposite its open side a permanent magnet or an element of ferromagnetic material which are disposed on the same level as the elements of ferromagnetic material or permanent magnets, respectively, on the receptacle; and that the receptacle held in a holder by means of the aligned position of an element of ferromagnetic material and a permanent magnet can, upon approaching the other holder; be rotated by means of engagement with the other holder by an integral multiple of half the inside angle of the n-gon and for transfer can be moved into the other holder by means of the aligned position of one element of ferromagnetic material and one permanent magnet.

4,489,334
IMMERSIBLE OXYGEN ABSORBING CAPSULE FOR INK JET FLUID SUPPLY

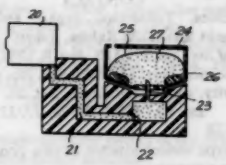
Akio Owatari, Shiojiri, Japan, assignor to Epson Corporation, Tokyo, Japan

Filed Jun. 9, 1982, Ser. No. 386,503

Claims priority, application Japan, Jun. 17, 1981, 56-93467

Int. Cl.³ G01D *15/18;* **C09D** *11/00*

U.S. Cl. 346—104 R **26 Claims**



1. An oxygen absorbing capsule for use in an ink composition in an ink jet recording device, comprising:

a capsule immersed in the ink composition with a capsule wall formed of a thin film of material which is insoluble in the ink composition and highly permeable to gases; and

an oxygen absorbing material encapsulated within the capsule wall, whereby the oxygen absorbing material will not be in direct contact with the ink composition.

4,489,335
INK JET PRINTING APPARATUS

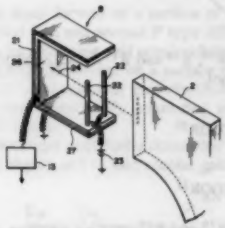
Masato Watanabe, Hachioji, and Kazuhiro Oda, Sayama, both of Japan, assignors to Konishiroku Photo Industry Co. Ltd., Japan

Filed Sep. 14, 1982, Ser. No. 417,906

Claims priority, application Japan, Sep. 14, 1981, 56-144977; Sep. 14, 1981, 56-144975

Int. Cl.³ G01D *18/00*

U.S. Cl. 346—140 R **8 Claims**



1. In an ink jet printing apparatus comprising a printing head having at least one nozzle for ejecting an ink droplet to a recording medium and means for moving said printing head along said recording medium, the improvement comprising:

(a) an ejection failure detector comprising:

(i) electrode means including at least one electrode for charging an ink droplet ejected from each nozzle, the printing head being moved opposite said ejection failure detector to a spit position by said moving means at predetermined time intervals corresponding to a certain number of times of scanning of said recording medium by said printing head,

(ii) a reception electrode positioned opposite the printing head and for receiving the charged ink droplet,

(iii) a detecting circuit for detecting the approach and arrival of the charged ink droplet at said reception electrode, and

(b) means for purging said nozzle by moving said printing head to a purging position by said moving means and causing the ink to be ejected forcibly from said nozzle when said printing head is at said purging position.

4,489,336
PRESSURE SENSITIVE MANIFOLD PAPER

Shoji Aoyagi, and Tetsuo Shiraishi, both of Amagasaki, Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

Filed May 20, 1982, Ser. No. 380,393

Claims priority, application Japan, Jun. 5, 1981, 56-87042; Jun. 19, 1981, 56-95793

Int. Cl.³ B41M *5/22*

U.S. Cl. 346—209 **14 Claims**

1. A pressure sensitive manifold paper having microcapsules incorporated therein, the microcapsules enclosing a nonvolatile organic solvent and a color former in the organic solvent, the organic solvent further comprising at least one of an alkylphenol compound and a mercaptan, in an amount of 0.2 to 10 parts by weight per 100 parts by weight of the organic solvent, and at least one of phosphorous acid triesters and thioesters,

the mercaptan being in the form of a solid at room temperature or having a boiling point of at least 150° C.,

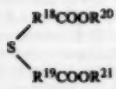
wherein the alkylphenol is selected from the group consisting of phenols having a substituent selected from the group consisting of alkyl, cycloalkyl, alkylene and hydroxyl substituents at least at one of the 2- and 6-positions, and derivatives thereof,

the mercaptan is selected from the group consisting of alkyl monomercaptans, alkyl dimercaptans, aromatic monomercaptans, aromatic dimercaptans, and derivatives thereof, and

the phosphorous acid triesters and thioesters are selected from the group represented by the formula (8) and formula (9):

(8)

wherein R^{15}, R^{16} and R^{17} are C_{4-20} alkyl, phenyl or C_{7-20} alkylphenol,



(9)

wherein R^{18} and R^{19} are C_{1-6} alkylene, and R^{20} and R^{21} are C_{8-22} alkyl.

4,489,337

HEAT-SENSITIVE RECORDING PAPER

Shojiro Watanabe, and Hiroharu Matsukawa, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 21, 1983, Ser. No. 553,920

Claims priority, application Japan, Nov. 22, 1982, 57-205269

Int. Cl.³ B41M *5/18*

U.S. Cl. 346—209 **7 Claims**

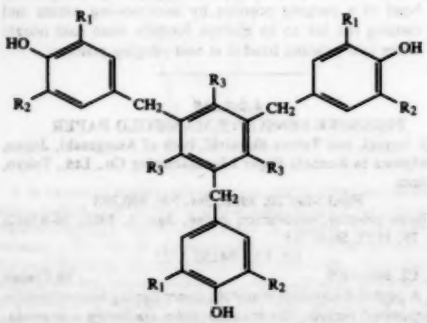
1. A heat-sensitive recording paper, comprising:

a support base having thereon:

an almost colorless electron donating dye;

an organic acid capable of coloration upon contacting the dye; and

a phenolic compound represented by the following general formula (I):



(I)

wherein R_1 is a branched alkyl group having 3 to 8 carbon atoms, R_2 is a hydrogen atom or a branched alkyl group having 3 to 8 carbon atoms, and R_3 is a hydrogen atom or a methyl group.

4,489,338

MEMORY CELL WITH THICK OXIDE AT LEAST AS DEEP AS CHANNEL STOP

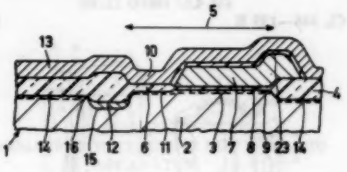
Wilhelmus G. Voncken, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 9, 1981, Ser. No. 319,166

Claims priority, application Netherlands, Nov. 28, 1980, 8006482

Int. Cl.³ H01L *29/78, 29/90, 27/10, 29/34*

U.S. Cl. 357—23 **6 Claims**



1. A semiconductor device having at least one memory cell comprising a semiconductor body having a surface region of a first conductivity type which is covered with a thick insulating layer, at least one aperture in the thick insulating layer at the area of a storage element of the memory cell, said storage element comprising a capacitor having a first plate of electrically conductive material and a part of the semiconductor body which is separated from the first plate by a dielectric, which forms a second plate of the capacitor and which is connected to a semiconductor zone of a second conductivity type opposite to the first via a channel region controllable by a gate electrode, the thick insulating layer being thicker than the dielectric and the gate electrode being connected to a first selection line of conductive material of the memory cell, said selection line extending above said semiconductor zone, which zone forms part of a second selection line of the memory cell, said semiconductor zone being present substantially entirely below the thick insulating layer, which thick insulating layer at the area of the semiconductor zone extends into the semiconductor body down to a depth different from the depth at other places at the surface of said body, and at least one channel stopping region of said first conductivity type located beneath said thick insulating layer and adjacent to but spaced apart from said semiconductor zone, so that no p-n junction is formed between said channel stopping region and said semiconductor zone, said at least one channel stopping region comprising substantially uniform channel stopping regions present between several memory cells below the thick insulating layer, the thick insulating layer at the area of the semiconductor zone extending into the semiconductor body down to a depth which is at least equal to the maximum depth of the channel stopping regions.

4,489,339

SOS MOSFET WITH SELF-ALIGNED CHANNEL CONTACT

Yukimasa Uchida, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 271,119, Jun. 8, 1981, abandoned. This application Nov. 14, 1983, Ser. No. 551,186

Claims priority, application Japan, Jul. 25, 1980, 55-102290

Int. Cl.³ H01L *29/78, 27/12*

U.S. Cl. 357—23 **9 Claims**

1. A MOS type semiconductor device comprising:

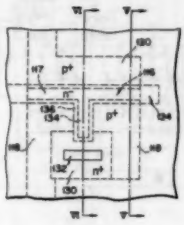
an insulating substrate;

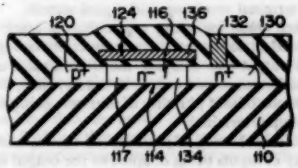
a substrate region of one conductivity type provided on said insulating substrate, said substrate region positioned under a channel region, and said substrate region having an extended substrate portion extending in the channel

length, which is the direction of current flow, away from said channel region;

a source region of an opposite conductivity type which is provided in said insulating substrate, contacting one side surface of said substrate region under said channel region;

a drain region of the opposite conductivity type which is provided on said insulating substrate, contacting the other side surface of said substrate region under said channel region, the pair of said source and drain regions being separately formed sandwiching said substrate region under the channel region and said extended substrate portion extending to one of said source and drain regions;





a gate insulating film provided on said substrate region;

a gate electrode provided on said gate insulating film so as to cover said substrate region, said gate electrode having an extended gate portion corresponding to said extended substrate portion of said substrate region; and

a substrate potential takeout region of one conductivity type which is provided on said insulating substrate and is connected to said extended substrate portion of said substrate region, whereby potential may be applied to said substrate region under the channel region through said substrate potential take-out region.

4,489,340

PNPN LIGHT SENSITIVE SEMICONDUCTOR SWITCH WITH PHOTOTRANSISTOR CONNECTED ACROSS INNER BASE REGIONS

Jun Ueda; Haruo Mori; Kazuo Hagimura; Hirokazu Tsukada, and Kotaro Kato, all of Tokyo, Japan, assignors to Nippon Telegraph & Telephone Public Corporation and Oki Electric Industry Co., Ltd., both of Tokyo, Japan

Filed Jan. 28, 1981, Ser. No. 228,935

Claims priority, application Japan, Feb. 4, 1980, 55-11472; Feb. 4, 1980, 55-11473

Int. Cl.³ H01L *29/74*

U.S. Cl. 357—38 **1 Claim**

1. In a PNPN semiconductor switch of the type comprising:

an N type semiconductor substrate;

a first P type diffused region formed in said substrate;

a second P type diffused region formed in said substrate so as to be spaced apart from said first P type diffused region by a predetermined distance;

a first N type diffused region formed in said second P type diffused region;

a second N type diffused region formed in said second P type diffused region so as to be spaced apart from said first N type diffused region by a predetermined distance;

a first gate insulating layer formed on a surface of said second P type diffused region between said first and second N type diffused regions;

a P type gate electrode electrically connected to said second P type diffused region and said second N type diffused region;

a first gate electrode of an N type polycrystalline silicon formed on a surface of said first gate insulating layer between said first and second N type diffused regions;

a first resistance region of an N type polycrystalline silicon formed so as to extend from said first gate electrode to said P type gate electrode;

a second gate insulating layer overlying said first gate electrode;

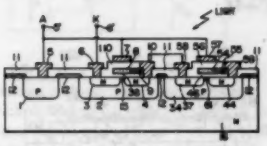
a semiinsulating layer formed on a surface of said substrate except over said first and second P type diffused regions;

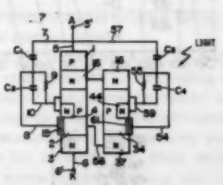
an insulating layer overlying said semiinsulating layer;

a second gate electrode formed on a surface of said second insulating layer over said first gate electrode;

a cathode electrode electrically connected to said first N type diffused region;

and an anode electrode electrically connected to said first P type diffused region and to said second gate electrode;





the improvement which comprises a high resistance region having a low N type impurity concentration formed immediately beneath said first gate insulating layer and between said first and second N type diffused regions, said high resistance region acting a shunt resistor so as to thereby provide a high gate sensitivity for said PNPN semiconductor switch; and further comprising a phototransistor for amplifying a collector current caused by being exposed to light, wherein said phototransistor comprises:

a third P type diffused region formed in said substrate so as to be spaced from said second P type diffused region by a predetermined distance;

a third N type diffused region formed in said third P type diffused region;

a fourth N type diffused region formed in said third P type diffused region so as to be spaced from said third N type diffused region by a predetermined distance;

a third gate insulating layer formed on a surface of said third P type diffused region between said third and fourth N type diffused regions;

a third gate electrode of an N type polycrystalline silicon formed on a surface of said third gate insulating layer between said third and fourth N type diffused regions;

a base electrode electrically connected to said fourth N type diffused region and said third P type diffused region;

a second resistance region of an N type polycrystalline silicon formed so as to extend from said third gate electrode to said base electrode;

a semiinsulating layer formed on a surface of said substrate except over said second and third P type regions;

an emitter electrode electrically connected to said third N type diffused region and to said P gate electrode;

a fourth gate insulating layer formed on a surface of said third gate electrode;

a fourth gate electrode disposed on a surface of said fourth gate insulating layer over said third gate electrode and electrically connected to said anode electrode;

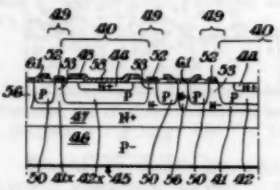
and another high resistance region having a low N type impurity concentration formed immediately beneath said third gate insulating layer and between said third and fourth N type diffused regions.

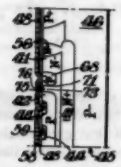
4,489,341

MERGED-TRANSISTOR SWITCH WITH EXTRA P-TYPE REGION

James F. Mayrand, Shrewsbury, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Sep. 27, 1982, Ser. No. 423,967
Int. Cl.³ H01L 27/02
U.S. Cl. 357—51 **10 Claims**





1. A merged-transistor switch of the kind including a P-type silicon substrate (46) having an N-type epitaxial pocket (41), a double-diffused-vertical NPN transistor (40) formed in said epitaxial pocket (41) which serves as the NPN transistor collector, and including in said epitaxial pocket (41) an input P-MOS transistor (49) comprised of a P-type source region (50) formed in said epitaxial pocket (41) adjacent and spaced from a portion of the P-type base region (42) of said NPN transistor (40), and a metal gate (52) over the gap between said P-type source region (50) and base region (42), said NPN base region (42) serving as the drain of said P-MOS transistor (49), wherein the improvement comprises:

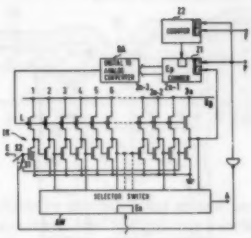
a third P-type region (68) formed in said epitaxial pocket (41) adjacent and spaced from another portion of said P-type base region (42) to form a lateral PNP transistor (64) therewith, in said N-type epitaxial pocket (41) and one metal layer (58) contacting both the emitter of said NPN transistor (40) and said third P-type region (68).

4,489,342

MOSFET INTEGRATED DELAY CIRCUIT FOR DIGITAL SIGNALS AND ITS USE IN COLOR-TELEVISON RECEIVERS

Wolfgang Gollinger, Gundelfingen; Hermannus Schat, Freiburg; Dieter Holzmann, Freiburg-Munzingen; Herbert Elmis, Denzlingen; Holger Struthoff, and Detlev Kunz, both of Freiburg, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Feb. 16, 1982, Ser. No. 349,228
Int. Cl.³ H04N 5/93
U.S. Cl. 358—17 **19 Claims**



1. An integrated delay circuit for digital signals, in which the time delay is adjustable in equidistant steps comprising:

an input terminal receiving said digital signals;

an inverter chain including a plurality of static inverters connected in series, each static inverter having an input and an output and delaying the transmission of a signal from said input to said output by a delay time, the input of the first one of said plurality of inverters being coupleable to said input terminal;

selector means having a plurality of inputs, each of said plurality of inputs being coupled to the output of a predetermined one of said plurality of inverters, and an output, said selector means selectively connecting one of said plurality of inputs to said output;

first means for coupling the output of a predetermined one of said plurality of inverters to the input of said first inverter during a measuring interval to form an inverter ring having an odd number of inverters such that self-excited oscillation occurs in said inverter ring to provide an output signal;

second means responsive to said output signal for determining the time delay of said inverter ring from the frequency of said self-excited oscillation; and

third means coupled to said inverter chain and responsive to said second means for changing the time delay between said input terminal and said selector means output.

4,489,343

TELEVISION IMAGE RECEIVER PROVIDED WITH VERTICAL SYNCHRONIZING CIRCUIT COUNT SYSTEM

Nobukazu Hosoya, Nara, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

PCT No. PCT/JP81/00230, § 371 Date Apr. 12, 1982, § 102(e) Date Apr. 12, 1982, PCT Pub. No. WO82/01107, PCT Pub. Date Apr. 1, 1982
PCT Filed Sep. 11, 1981, Ser. No. 371,296
Claims priority, application Japan, Sep. 12, 1980, 55-127464
Int. Cl.³ H04N 9/44
U.S. Cl. 358—17 **8 Claims**

1. A television receiver comprising:

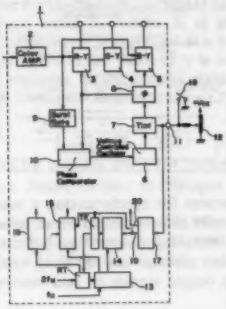
(a) a vertical synchronization circuit having:

(i) a counter means for counting down the horizontal synchronization pulses, said counter means having a plurality of flip-flops connected in series to each other;

(ii) first decoder means, coupled to the output of said

counter means, for specifying a predetermined region related to a frequency of the vertical synchronization signal; and

(iii) reset signal producing means for resetting said counter means in response to said vertical synchronization signal when a vertical synchronization signal is applied only in said predetermined region, and resetting said counter means in response to an output from said first decoder means at a count which corresponds to the edge of said range and which is greater than when a vertical synchronization signal is not applied within said predetermined region; and



(b) second decoder means, coupled to the output of said counter means, for generating a pulse representing a particular line after the vertical synchronization signal period and equivalent pulse period.

2. A television receiver as claimed in claim 1, wherein said first and second decoder means have, respectively, an NTSC portion and PAL portion connected to output terminals of said counter means producing counted numbers which are different from each other, and wherein said television receiver has an NTSC/PAL switch for selecting either the NTSC portion or PAL portion.

4,489,344

SIGNAL PROCESSING UNIT

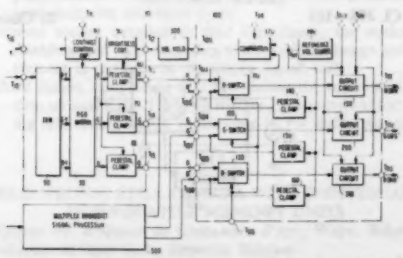
Masaki Ikeda; Tatsuyuki Amano, and Kazuo Tokuda, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Sep. 1, 1982, Ser. No. 413,656

Claims priority, application Japan, Sep. 1, 1981, 56-137439; Sep. 17, 1981, 56-146765

Int. Cl.³ H04N 9/535

U.S. Cl. 358—22 **10 Claims**



1. A signal processing circuit comprising switching means for receiving a first signal having a pedestal potential and representing a first image and a second signal having a pedestal potential and representing a second image and for outputting either one of said first and second signals, clamping means for clamping the pedestal potential of said second signal at a reference voltage, comparator means for comparing the pedestal potential of said first signal with said reference voltage and for providing an output, and feedback means responsive to the output of said comparator means for equalizing the pedestal potential of said first signal to said reference voltage.

4,489,345

COLOR VIDEO CAMERA

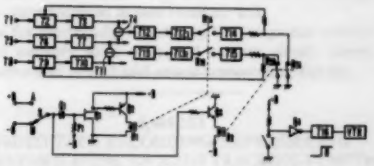
Takashi Itani; Susumu Kozuki, and Takashi Narasawa, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha

Continuation of Ser. No. 300,664, Sep. 9, 1981, Pat. No. 4,454,532. This application Jan. 18, 1984, Ser. No. 571,908

Claims priority, application Japan, Sep. 10, 1980, 55-125505; Nov. 21, 1980, 55-165176

Int. Cl.³ H04N 5/35

U.S. Cl. 358—29 **4 Claims**



1. A color image pick-up device, comprising:

(a) image pick-up means arranged to convert an image into an electrical signal including a plurality of color signal components;

(b) white balance control signal forming means for forming a white balance control signal;

(c) memory means for memorizing said control signal;

(d) white balance control means for controlling a proportion of each color signal component contained in the output signal of said image pick-up means in accordance with said control signal memorized in said memory means;

(e) a first switch for actuating the white balance control signal forming means to start forming said control signal and for causing said memory means to memorize said control signal;

(f) a second switch for actuating an image recording; and

(g) a successive operation member for sequentially actuating said first switch and said second switch in the named order.

4,489,346

SEPARATING FILTER

Yutaka Tanaka, Yokohama, and Toshinobu Isobe, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 21, 1982, Ser. No. 420,952

Claims priority, application Japan, Sep. 21, 1981, 56-149182

Int. Cl.³ H04N 9/535

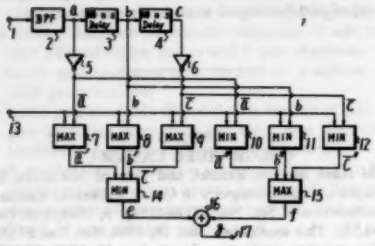
U.S. Cl. 358—31 **15 Claims**

1. A separating filter comprising:

(a) a band pass filter supplied with a composite color video signal, having a resonance frequency of a chrominance sub-carrier frequency and producing an output;

(b) first means supplied with the output of said band pass filter for generating first and second signals having the same phase but having a different time relationship; and

(c) second means for comparing levels of said first and second signals with a level of a reference signal and for selecting the one of said first and second signals having a level nearer the reference signal level.

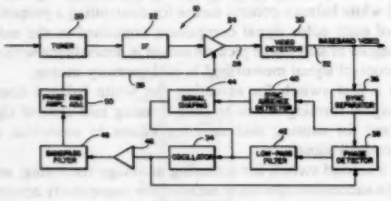


4,489,347

SINE-WAVE DECODING TECHNIQUE

Michael Tentler, Prospect Heights, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Aug. 30, 1982, Ser. No. 413,003
Int. Cl.³ H04N 7/16, 1/02
U.S. Cl. 358—118 **6 Claims**



1. A circuit for decoding a television signal which is amplitude modulated by a sine wave encoding signal for suppressing horizontal sync intervals and enhancing video intervals, comprising:

means for modulating the television signal with a decoding sine wave signal;

means for detecting the baseband video signal characterizing the output of said modulating means;

horizontal sync separator means for processing the detected baseband video signal;

a phase lock loop including oscillator means having an output developing said decoding signal, said phase lock loop being responsive to the output of said horizontal sync separator means for assuming either a first locked state wherein the output of said oscillator means is locked in phase alignment with the encoding sine wave signal or a second locked state wherein the output of said oscillator means is locked in antiphase relationship with the encoding sine wave signal; and

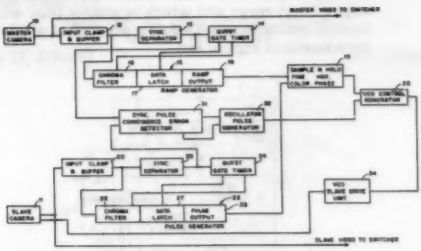
means causing the phase lock loop to break lock in response to the assumption thereby of said first locked state.

4,489,348

VIDEO CAMERA SYNCHRONIZER

John A. Lepley, Lawton, Mich., assignor to Gordon W. Hueschen, Kalamazoo, Mich.

Filed Sep. 23, 1982, Ser. No. 422,361
Int. Cl.³ H04N 5/04
U.S. Cl. 358—149 **13 Claims**



1. An apparatus for synchronizing a master video camera with one or more slave video cameras, which comprises:

means for receiving output signals from said master and slave video cameras and deriving synchronizing signals from the output signals of said master and slave video cameras;

means for comparing the synchronizing signals from said master and slave cameras and deriving an error signal when the synchronizing signals of said master and slave video cameras are not in synchronization;

means connected to said error signal deriving means arranged to produce oscillator stop current pulses when actuated by said error signal;

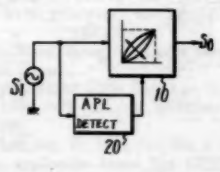
a voltage controlled oscillator arranged to receive said oscillator stop current pulses, connected to a control circuit of a slave video camera whereby, when said master and said slave video cameras are not in synchronization, the error signal from said error signal detecting means causes oscillator stop pulses to be produced which turn the output from said voltage-controlled oscillator on and off until the master video camera signal and the slave video signal are in synchronization.

4,489,349

VIDEO BRIGHTNESS CONTROL CIRCUIT

Takashi Okada, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 2, 1981, Ser. No. 230,394
Claims priority, application Japan, Jan. 31, 1980, 55-10667
Int. Cl.³ H04N 5/68
U.S. Cl. 358—168 **21 Claims**



1. A control circuit for controlling the brightness of a video signal that fluctuates between a peak dark level and a peak bright level about an average brightness level comprising:

brightness controlling means having a signal input to which the video signal is applied as an input video signal and a signal output from which an output video signal is provided, said brightness controlling means being operable by

a control signal for controlling the brightness of the video signal so that respective portions of said output video signal corresponding to portions of the input video signal at said peak dark level and at said peak bright level are provided substantially at said peak dark and bright levels while the average picture level of said output video signal is provided at a predetermined optimum level;

average picture level detecting means for detecting the average brightness level of at least one of said input and output video signals and providing said control signal in response to the detected average brightness level; and

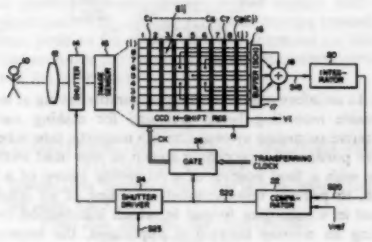
a variable gamma correction circuit included in said brightness controlling means and having an input-output characteristic such that for the input video signal having a level proportional to a value X, where X is in the range $0 \leqq X \leqq 1$, said video signal is provided at a level proportional to a value X^{γ}; and the value of γ is automatically determined in response to the control signal from said average picture level detecting means.

4,489,350

SOLID-STATE IMAGE PICKUP DEVICE

Kenji Kimura, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 9, 1982, Ser. No. 396,778
Claims priority, application Japan, Jul. 22, 1981, 56-114626
Int. Cl.³ H04N 3/14, 5/26
U.S. Cl. 358—213 **13 Claims**



1. A solid-state image pickup device comprising:

an image pickup element with a light-receiving surface on which a plurality of photoelectric conversion cells are arranged;

first means, coupled to at least one and less than all of said photoelectric conversion cells of said image pickup element, for generating a timing signal when an output level of said at least one photoelectric conversion cell corresponding to an amount of light incident on said at least one photoelectric conversion cell connected thereto reaches a predetermined reference level;

second means, coupled to said first means, for optically shielding said light-receiving surface of said image pickup element in response to the timing signal; and

third means, coupled to said first means for reading image data on said light-receiving surface, in an interval following said timing signal, in response to the timing signal.

4,489,351

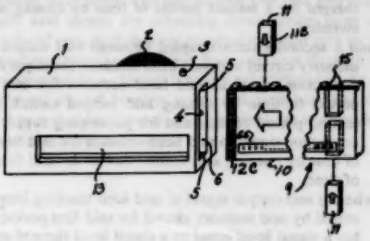
ELECTRONIC STILL CAMERA WITH INDIVIDUAL NON-VOLATILE MEMORY UNITS

Stephane M. d'Alayer de Costemore d'Arc, Ways, Belgium, assignor to Staar S. A., Brussels, Belgium

Filed Sep. 17, 1982, Ser. No. 419,518
Claims priority, application Belgium, Sep. 28, 1981, 206080
Int. Cl.³ H04N 3/14
U.S. Cl. 358—213 **13 Claims**

1. An image recording device for an electronic still camera having an optical system and a transducer comprising CCD image sensors for producing image representing signals responsive to an image focused thereon by said optical system, and circuit means for transmitting said signals to said recording device, said device comprising:

a cassette of individual integrated circuit memory units for mounting in said camera, said cassette including:



a plurality of individual integrated circuit non-volatile memory units received in said cassette; and

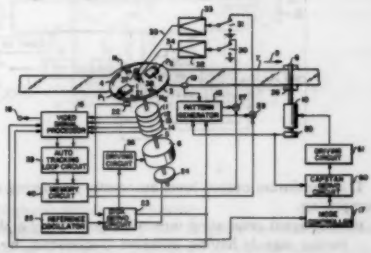
means for electrically connecting the integrated circuits of said memory units with said camera circuit means to receive and record said image representing signals.

4,489,352

VIDEO TAPE RECORDING/REPRODUCING APPARATUS HAVING AN AUTO TRACKING FUNCTION

Masaaki Kobayashi, Kawanishi; Masao Tomita, Neyagawa; Masayuki Matsumoto, Hirakata; Masahiro Honjo, Neyagawa, and Kazuhiro Yamanishi, Higashiosaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 13, 1982, Ser. No. 367,976
Claims priority, application Japan, Apr. 13, 1981, 56-56085
Int. Cl.³ H04N 5/783
U.S. Cl. 360—10.3 **2 Claims**



1. A video tape recording/reproducing apparatus having an auto tracking function and having a first reproduction mode with a first tape speed corresponding to that used in a recording mode and a second reproduction mode with a second tape speed which is different from that of said first tape speed, said apparatus comprising:

a first rotary head used for said first reproduction mode and mounted on a rotary disk;

a second rotary head used for the second reproduction mode and mounted on a heat actuator which is in turn mounted on said rotary disk;

an auto tracking loop circuit coupled to said second rotary head for outputting a correction signal for correcting tracking of said second rotary head when said second rotary head is shifted from being on track;

a memory circuit coupled to said auto tracking loop circuit

and including a memory element and also including a first switch for storing, during said first reproduction mode, an output signal from said auto tracking loop circuit, said storing effected by said memory element for a first period of time by selectively opening said first switch and for passing during said same first reproduction mode an output signal from said auto tracking loop circuit to an output thereof for a second period of time by closing said first switch;

and a second switch coupled between said output of said memory circuit and said head actuator for supplying said correction signal to said head actuator for said second period of time by closing said second switch for said second period of time and for preventing supply of said correction signal to said head actuator for said first period of time by opening said second switch for said first period of time;

wherein said output signal of said auto tracking loop circuit stored by said memory circuit for said first period of time has a signal level equal to a signal level thereof at an end of said second period of time, and said second period of time is preliminarily selected so as to minimize deterioration of said head actuator.

4,489,353

MAXIMUM OUTPUT LEVEL AUTOMATIC MEASURING APPARATUS

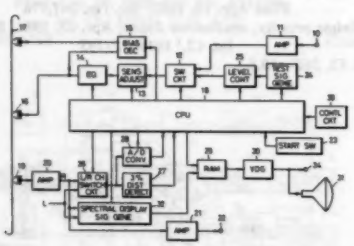
Mamoru Inami, Yokohama; Zenju Ohtsuki, Tokyo, and Yoshiaki Tanaka, Fujisawa, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Oct. 13, 1982, Ser. No. 434,102

Claims priority, application Japan, Oct. 15, 1981, 56-164499; Dec. 2, 1981, 56-194245; Dec. 2, 1981, 56-194246

Int. Cl.³ G11B *15/02, 5/02*

U.S. Cl. 360—25 **11 Claims**



1. A maximum output level automatic measuring apparatus comprising:

testing signal generating means for generating a plurality of testing signals having different frequencies, by independently varying respective levels of the testing signals;

recording and reproducing means for recording said plurality of testing signals from said testing signal generating means onto a magnetic recording medium, and reproducing the recorded testing signals;

level detecting means for detecting reproduced levels of said plurality of testing signals from said recording and reproducing means; and

display means for displaying a maximum output level curve according to reproduced levels detected at said level detecting means,

said level detecting means detecting that reproduced levels of said plurality of testing signals have reached predetermined values preset with respect to the respective testing signals,

said display means comprising a display screen having a frequency axis and a level axis, and independently displaying the reproduced levels which reached the predetermined values detected by said level detecting means for each of the frequencies.

4,489,354

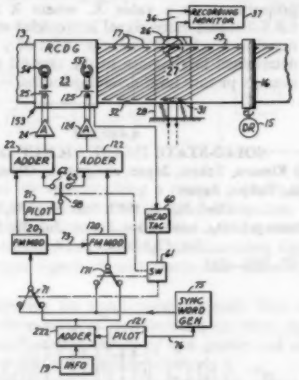
INFORMATION RECORDING SYSTEM WITH RECORDING PROCESS MONITORING FUNCTION

Bert H. Dana, Saratoga, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 210,468, Nov. 24, 1980,. This application Aug. 16, 1982, Ser. No. 408,102

Int. Cl.³ G11B *15/12, 15/02*

U.S. Cl. 360—64 **7 Claims**



1. In an information recording apparatus having at least two movable recording heads arranged for making successive operative recording sweeps across a magnetic tape wherein an initial portion of a recording sweep of one head overlaps in time with a final portion of a recording sweep of a second head, to provide uninterrupted recording of an information signal in a recording format in which information recorded during an overlap interval is duplicated, the improvement comprising:

a. synchronizing means, operable during the overlap interval, for producing a synchronization signal; and

b. timing means, operably associated with at least one of the recording heads and said synchronizing means, for time division multiplexing of the synchronization signal and the information signal, to cause one of the recording heads to temporarily interrupt the recording of the information signal to record the synchronization signal during the overlap interval, whereby the portion of the information signal lost by the time division multiplexing of the synchronization signal is recorded by the other of the heads.

4,489,355

LOCKING DEVICE FOR A MAGNETIC TAPE CASSETTE IN A MAGNETIC TAPE DEVICE

Guttorm Rudi, Fjellhamar, Norway, assignor to Tandberg Data A/S, Oslo, Norway

Filed Mar. 30, 1982, Ser. No. 363,443

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1981, 3112845

Int. Cl.³ G11B *15/24*

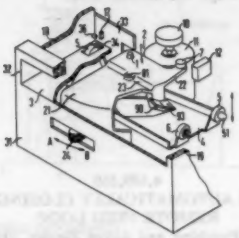
U.S. Cl. 360—96.5 **12 Claims**

1. A locking device for a magnetic tape cassette which has two engagements at its underside and which is receivable in a stationary insertion slot of a magnetic tape device, the insertion slot having a rectangular base area, comprising:

lock-in means for holding the magnetic tape cassette in a reference position;

an ejector means for ejecting the tape cassette;

the lock-in means comprising a horizontally movable lever seated in an axis of revolution disposed perpendicularly relative to the base area, the lever having a locking arm and a thrust arm, a carrier, guide means for permitting the carrier to move toward and away from the base area in substantially perpendicular fashion when actuated by the thrust arm via a wedge means which pushes by wedging action the carrier along the guide means, and the carrier having a plurality of engagement bodies engageable with the cassette in the stationary insertion slot;



the ejector means comprising an ejector arm connected to the lever and an abutment connected thereto; and

the lever being horizontally movable between lock and unlocked positions such that when moving towards the lock position the engagement bodies engage with the engagements of the cassette and when moving toward the unlock position the ejector arm and abutment are dimensioned such that the abutment pushes the cassette partially out of the insertion slot.

4,489,356

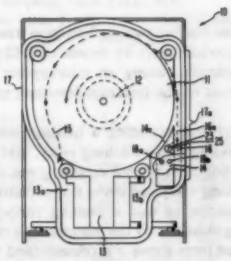
ENCLOSED DISK DRIVE WITH IMPROVED AIR FILTRATION SYSTEM

Paul L. Farmer, San Martin, Calif., assignor to Atasi Corporation, San Jose, Calif.

Filed Jun. 24, 1982, Ser. No. 391,782

Int. Cl.³ G11B *5/012*

U.S. Cl. 360—97 **12 Claims**



1. A disk drive assembly comprising:

a housing containing a selected gas and including a housing top and housing bottom with side walls connecting the top and bottom to provide an enclosed chamber;

at least one disk mounted so as to rotate within said housing and thereby to rotate the gas contained within said housing for removal at a disk periphery;

at least one read/write head for reading information stored on said at least one disk;

actuator assembly means in said housing for actuating said at least one read/write head to traverse radially across said at least one disk; said actuator assembly means being located in a housing peripheral area adjacent to an opening at a first position of said at least one disk so as to receive gas accelerated by the rotation of said disk and to turbulently mix said gas, said gas being substantially decelerated in the area of said actuator assembly so as to increase the static pressure of said gas in said area; and

means for filtering the gas within said assembly, said means for filtering comprising a filter element peripherally mounted with respect to said at least one disk and placed beside said means for actuating downstream from said peripheral area such that gas pumped into said area by said at least one rotating disk flows from said area through said filter element to a channel between said filter element and a sidewall of said housing at the disk periphery and then back to said at least one disk, where said gas is reaccelerated by the rotation of disk.

4,489,357

MAGNETIC SENSOR HAVING MULTILAYERED FLUX CONDUCTORS

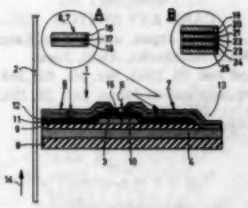
Johannes A. C. Van Ooijen, Asperen, and Robertus D. J. Verhaar, Eindhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 23, 1982, Ser. No. 371,039

Claims priority, application Netherlands, May 1, 1981, 8102148

Int. Cl.³ G11B *5/12, 5/25*

U.S. Cl. 360—113 **5 Claims**



1. A magnetic sensor, comprising:

an elongate and generally flat magneto-resistance element which has a magnetic anisotropy in which the easy axis of magnetization lies in the major plane of the element;

two magnetically permeable components situated in one plane between which components a gap is present, the gap being bridged magnetically by the magneto-resistance element;

a body of a magnetically permeable material disposed parallel to the two components, the body having one end coupled magnetically to an end of a first of the two components remote from the gap, an end of the second magnetically permeable component remote from the gap being adapted to be brought in a flux coupling relationship with an external magnetic field, characterized in that

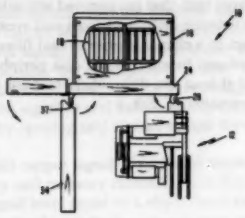
each magnetically permeable component includes at least two parallel layers of magnetically permeable materials each having substantially a first composition, and that an intermediate layer having a composition different from the first composition is present between the two parallel layers.

4,489,358

LIGHT WEIGHT CHASSIS AND CABINET ASSEMBLY FOR MAGNETIC TAPE RECORDER

William R. Davis, and David G. Hart, both of Sarasota, Fla., assignors to Fairchild Weston Systems, Inc., Sarasota, Fla.

Filed Sep. 24, 1982, Ser. No. 423,330
Int. Cl.³ H02B 1/02
U.S. Cl. 360—137 13 Claims



1. In a magnetic tape recorder, a light weight chassis and cabinet assembly, comprising

a rigid bezel;

a circuit board support means, including a wire frame carrying opposed pairs of circuit board guides and electrical connector means positioned to be connected to circuit boards supported between said guide pairs;

first means for supporting said wire frame to said bezel such that said bezel prevents deformation of said wire frame, said circuit board guides being approximately perpendicular to a plane of said bezel;

a magnetic tape transport mechanism; and

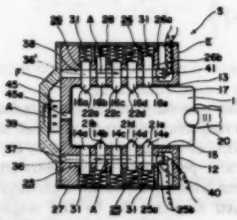
second means for pivotably supporting said tape transport mechanism to one end of said bezel to enable said mechanism to be pivoted outwardly from said frame.

4,489,359

CARD KEY SWITCH

Masaru Suzuki, Chiryu, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Jan. 26, 1983, Ser. No. 461,244
Claims priority, application Japan, Jan. 28, 1982, 57-12061
Int. Cl.³ E05B 49/00
U.S. Cl. 361—172 13 Claims



1. A card key switch comprising:

a card key which utilizes a card such as a driving license card, etc. or a card casing for accommodating said card therein having notches formed on opposite side edges thereof in accordance with a key code;

a key cylinder which is formed with a key slot for receiving said card key therein;

a plurality of tumblers which are provided at opposite sides of the key slot so as to be movable in a direction at right angles to a direction of insertion of said card key into the key slot such that some of the plurality of said tumblers are projected into the key slot through engagement with the notches of said card key respectively and the others of the plurality of said tumblers are retracted from the key slot by said card key in accordance with said key code upon insertion of said card key into the key slot;

the plurality of said tumblers each formed with a through-hole extending in the direction of insertion of said card key into the key slot;

a light emitting element; and

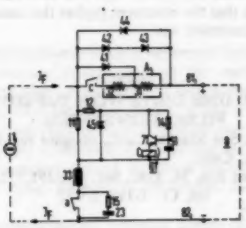
a photo detector which is operatively associated with said light emitting element so as to generate an electric signal in response to detection of light from said light emitting element through the tumbler holes.

4,489,360

CIRCUIT FOR AUTOMATICALLY CLOSING A BACKUP REMOTE FEED LOOP

Heinz Kraicar, Poecking, and Alfred Ziegler, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 23, 1983, Ser. No. 477,975
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1982, 3211497
Int. Cl.³ H01H 47/32
U.S. Cl. 361—187 10 Claims



1. A circuit for use in a remote feed loop transmission system for feeding electrical users by means of DC series feed, said circuit automatically closing an interruption in said remote feed loop in front of the interrupt location, said circuit comprising:

a longitudinal arm including a holding winding and a response winding of a switching relay, said response winding being effective in said circuit given non-actuation of said switching relay and being non-effective in said circuit given actuation of said switching relay, said switching relay being actuated by the maintenance of current in said remote feed loop above a predetermined value and being non-actuated if a prescribed fraction of a rated value of said remote feed loop current falls below said predetermined value;

a cross-arm including a break contact of said switching relay connected in series with a choke and a resistor;

a means for energizing said response winding of said switching relay including a first auxiliary relay, a resistor, and a first delay circuit interconnected between said first auxiliary relay and said resistor, said first auxiliary relay having a make contact connected in series with said response winding; and

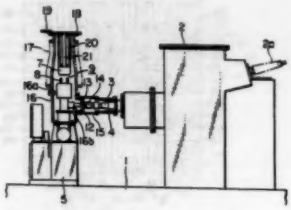
a diode bridging said make contact of said first auxiliary relay and said response winding and having a polarity arranged for conducting in the direction of said remote feed loop current.

4,489,361

HORIZONTALLY COMPACT SUBSTATION

Hiroaki Kitamura, Nishinomiya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 1, 1982, Ser. No. 438,253
Claims priority, application Japan, Nov. 12, 1981, 56-168953[U]
Int. Cl.³ H02B 5/04
U.S. Cl. 361—333 1 Claim



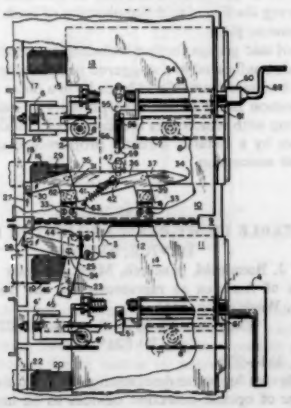
1. A substation comprising
a metallic tank,
an insulator mounted on said tank and extending substatially vertically above a lower portion of said tank,
a circuit breaker having breaking sections accomodated within said insulator and said tank, said sections breaking upon relative vertical movement,
a transformer mechanically connected to a lower portion of said metallic tank, and electrically connected to a lower terminal of said circuit breaker, and
a connection terminal secured to an upper portion of said insulator and electrically connected to an upper terminal of said circuit breaker.

4,489,362

ELECTRIC SWITCHBOARD APPARATUS WITH A BREAKER-FUSE INTERLOCK

Roger N. Castonguay, Terryville; Jon P. McCuin, Bristol, and David B. Powell, Burlington, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Mar. 1, 1983, Ser. No. 471,092
Int. Cl.³ H02B 1/04
U.S. Cl. 361—339 9 Claims



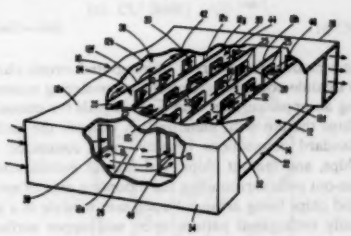
1. A circuit breaker-fuse interlock arrangement for an electric switchboard comprising:
a first compartment in an electric switchboard containing an electric circuit breaker;
a second compartment in said switchboard containing an electric fuse;
means interconnecting with said first and second compartment for preventing said electric fuse from being electrically disconnected while said circuit breaker is electrically connected;
first racking means for electrically connecting line and load plugs on said circuit breaker with first line and load stabs connecting with a power source and first blocking means in said first compartment for preventing access to said racking means; and
second racking means for electrically connecting line and load plugs on said electric fuse with second line and load stabs connecting with said circuit breaker;
said interconnecting means comprising a bell crank connected between said first and said second compartments wherein contact with said bell crank within said first compartment produces motion by said bell crank within said second compartment, a lift bar attached to said bell crank within said second compartment for becoming raised and lowered upon contact with said bell crank within said first compartment, a slide element intermediate said fuse and said lift bar for moving to a first position when said lift bar is raised and for moving to a second position when said lift bar is lowered, said slide element containing a pin projecting from a bottom of said slide and a tab projecting from said slide, said tab contacting said blocking means when said lift bar is in said first position.

4,489,363

APPARATUS FOR COOLING INTEGRATED CIRCUIT CHIPS

Norman Goldberg, Dresher, Pa., assignor to Sperry Corporation, New York, N.Y.

Filed Jan. 31, 1983, Ser. No. 462,275
Int. Cl.³ H05K 7/20
U.S. Cl. 361—383 3 Claims



1. An apparatus for cooling integrated circuit chips comprising:
a housing including a substrate, said substrate having apertures formed therethrough, said housing also including a partition mounted therein defining an inlet chamber and an outlet chamber, said partition having a plurality of openings formed therethrough;
a plurality of heat sinks mounted on said substrate, each heat sink having a first end extending into a respective one of said apertures;
each of said sinks having a second end extending into a respective one of said openings in said partition and having an inlet side of each sink exposed to said inlet chamber and having an outlet side of each sink exposed to said outlet chamber;
a fluid inlet and a fluid outlet in said housing, each inlet side being connected for conducting fluid from said inlet

chamber and each outlet side being connected for conducting fluid to said outlet chamber;

each heat sink further having a plurality of elongated spaces formed therethrough for defining a plurality of spaced apart fins for permitting fluid to flow through said heat sink from said inlet side to said outlet side; and

means covering each inlet side for resisting fluid flow between the fins.

4,489,364

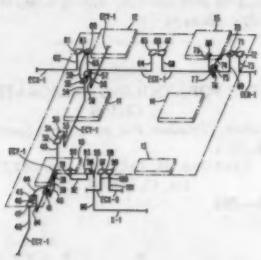
CHIP CARRIER WITH EMBEDDED ENGINEERING CHANGE LINES WITH SEVERABLE PERIODICALLY SPACED BRIDGING CONNECTORS ON THE CHIP SUPPORTING SURFACE

Dudley A. Chance, Danbury, Conn.; Alan Platt, LaGrangeville, N.Y.; Chung W. Ho, Chappaqua, N.Y., and Sudipta K. Ray, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1981, Ser. No. 337,057

Int. Cl.³ H05K 1/18

U.S. Cl. 361—395 **6 Claims**



1. In a module for an array of integrated circuit chips,

said module comprising a matrix of insulating material having an upper surface with a set of pads for connection of chips thereto with metallization beneath the surface for standard connections between pads connected to said chips, and fan-out chips, and fan-out metallization with fan-out pads surrounding the mounting area of each chip, said chips being arranged upon said module in a substantially orthogonal pattern upon said upper surface with engineering change pads deposited upon said upper surface adjacent to said fan-out areas, with parallel an orthogonal engineering change lines,

the improvement comprising embedding of said engineering change lines aligned within said matrix of said module beneath said upper surface with each of said engineering change lines in a predetermined orientation including a plurality of periodically spaced breaks along the length thereof with connection vias extending upwardly to said surface in parallel from the ends of each of said breaks to an engineering change pad in the form of a link,

whereby each of said links can be connected to one of said fan-out pads by means of fly-wires with all of said fly wires being shorter than a chip pitch and said link can be severed into two separate segments to provide a flexible wiring system with minimal inductive coupling, and minimal crossovers in the module employed for engineering change purposes.

4,489,365

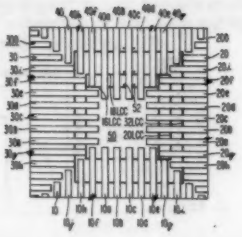
UNIVERSAL LEADLESS CHIP CARRIER MOUNTING PAD

David P. Daberkoe, Exton, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sep. 17, 1982, Ser. No. 419,235

Int. Cl.³ H05K 1/02

U.S. Cl. 361—403 **7 Claims**



1. A universal mounting pad layout of electrically conductive leads for accepting leadless chip carriers of different sizes comprising:

an interconnection medium for supporting said universal mounting pad and having a central rectangular area devoid of said leads,

said leads encompassing said area and being arranged in groups associated respectively with the sides of said rectangular area, the leads in each of said groups having their longitudinal axes oriented at right angles to the plane of the area side with which they are associated, the homologous leads in each pair of groups disposed on opposite sides of said rectangular area having respective coincident center lines,

a like plurality of said leads in each of said groups having their tips oriented in a common plane and terminating on the perimeter of said area,

a first of said groups including an additional pair of leads having their tips situated in said common plane with the tips of said like plurality of leads in the last mentioned group,

a second and a third of said groups adjacent to said first of said groups each including an additional lead having its tip situated in said common plane with the tips of said like plurality of said leads in one of the last mentioned groups,

a fourth of said groups opposite to said first of said groups having the tips of said like plurality of leads situated in said common plane,

each of said groups further including successive pairs of said leads configured in a staggered pattern wherein the tips of each of said pairs of said leads lie in a plane parallel to said common plane of said like plurality of said leads in the group with which they are associated, but displaced therefrom by a distance directly proportional to the order of their succession.

4,489,366

PORTABLE LIGHT-BEAM PROJECTOR LOCATING DEVICE, SYSTEM

Edward J. Rozniecki, Macomb, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 28, 1983, Ser. No. 461,722

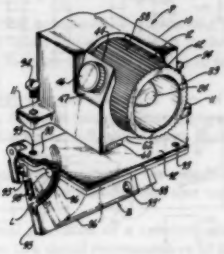
Int. Cl.³ F21V 21/26

U.S. Cl. 362—270 **8 Claims**

1. A device for use in determining the optimum location and coverage of optical detection devices to be installed on surfaces defining a volume to be monitored so as to ensure complete coverage of the volume to be monitored, said device including:

a projector housing including, a body corresponding generally to the configuration of the optical sensor to be installed at a specified location, said housing having a generally cylindrical passageway, and said housing having associated therewith a bracket template adapted to define a location at which mounting apertures are to be located in the surfaces defining the protected volume;

a light source located within the cylindrical passageway.



a light beam shroud mounted coaxially with said cylindrical passageway said shroud being adapted to move longitudinally relative to said cylindrical passageway so as to vary the cone of light cast by the light source; and

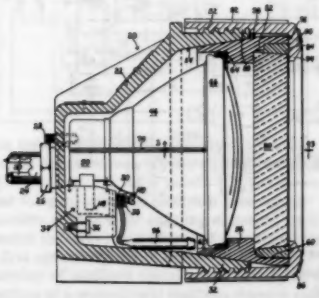
adjusting means for moving said light beam shroud between first maximum cone of light position and second minimum cone of light positions, said adjustment means having means associated therewith to hold the light beam projected from the shroud in a position corresponding to the volume protected by the optical detector to be installed.

4,489,367

HEADLIGHT PERMISSIBLE FOR USE IN EXPLOSIVE ATMOSPHERES

Charles R. Herron, 660 Tanager Dr., Bluefield, Va. 24605; Marvin L. Haines, Rte. 3, Box 76-D1, Princeton, W. Va. 24740, and Roger L. O'Quinn, 300 Hale St., Pearisburg, Va. 24134

Filed Sep. 16, 1983, Ser. No. 532,872
Int. Cl.³ F21V *3/00*
U.S. Cl. 362—311 **7 Claims**



1. An explosion-proof closure for an electric light bulb having a base adapted to be connected to a source of electrical power for energizing the bulb, and a lens at the opposite end of the bulb, the closure being usable in potentially explosive atmospheres such as underground coal mines, the closure comprising:

a housing having an opening therein at one end thereof, constituting the forward end of the housing, an end wall at the opposite end of the housing, constituting the rearward end of the housing, and side walls intermediate the ends of the housing, the interior surface of the side walls at the forward end of the housing tapering inwardly from the exterior to the interior of the housing a relatively long distance so as to define a relatively deep inwardly converging mouth surface at the opening in the housing;

a bulb retaining member adapted to receive the lens of the bulb in generally surrounding relation, the retaining member being engageable generally at one end thereof, constituting its rearward end, with the bulb and having a lens cover at its opposite end, constituting its forward end, for protecting the lens, the retaining member further having a relatively wide peripheral surface tapering inwardly from the forward to rearward end thereof to define a relatively wide inwardly coverging retainer surface, said retainer surface being so sized and shaped relative to said mouth surface of the housing as to enable the retaining member to be fitted in the opening in the housing a significant depth, with the retainer surface and the mouth surface being in surface-to-surface sealing engagement along the entire peripheries thereof;

means for detachably mounting the retaining member on the bulb to form a bulb sub-assembly, separate from the housing, adapted to be positioned in the housing and close the opening therein; and

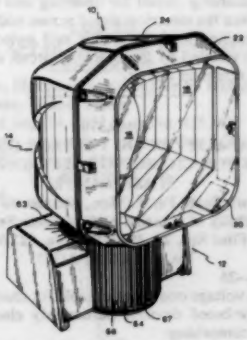
means for detachably securing the sub-assembly to the housing, whereby with the sub-assembly secured to the housing said explosion-proof closure presents a relatively long flame path at the opening to the housing for quenching any ignited gases tending to flow outwardly from the closure between the housing and the retaining member on an internal explosion in the closure, and with the sub-assembly removed from the housing, a defective light bulb readily can be replaced in the sub-assembly.

4,489,368

HIGH INTENSITY DISCHARGE LIGHT FIXTURE

Richard Sangiamo, 263 E. 4th Ave., Roselle, N.J. 07203, and Thomas Russello, 752 Newark Ave., Elizabeth, N.J. 07208

Filed Dec. 27, 1983, Ser. No. 565,908
Int. Cl.³ B60Q *1/00*
U.S. Cl. 362—368 **14 Claims**



1. A high intensity discharge light fixture comprising:

a fixture housing;

a first housing component terminating at one end in a U-shaped section defined by a first leg directed toward the fixture interior, a second leg directed toward the fixture exterior; and a base interconnecting said legs, said first leg being at least as long as said second leg;

a second housing component;

a first end of said second housing component interdigitated between said first housing component first and second legs

whereby to define a joint between said housing components; and

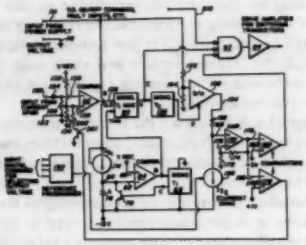
means for directing water from said joint.

4,489,369

CONTROL CIRCUIT FOR A FLYBACK STEPCHARGER

Howard S. Ginsberg, Baltimore County, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 28, 1983, Ser. No. 508,691
Int. Cl.³ H02M 3/335
U.S. Cl. 363—21 **7 Claims**



1. A control circuit for a power supply, comprising:

a transformer having a primary and a secondary, said secondary powering a load connected across the secondary;

a switching transistor for powering the primary of said transformer;

a timing circuit for producing a delay after receiving an initialization signal, said timing circit varying said delay inversely as the electrical signal across said load, said timing circuit receiving a reinitializing signal a set time after the end of said delay;

an enabling circuit for enabling on said switching transistor after said delay;

a first disabling circuit for disabling said switching transistor when the current on the primary reaches a predetermined primary limit;

a second disabling circuit for disabling said switching transistor when the electrical signal across said load exceeds a predetermined load limit after said switching transistor has been enabled by the enabling circuit and disabled by the first disabling circuit.

4,489,370

HIGH CAPACITY DC-DC VOLTAGE CONVERTER SUITABLE FOR CHARGING ELECTRONIC CAMERA FLASH LAMPS

Albert Migliori, Santa Fe, N. Mex., assignor to Melvin A. Pfaelzer and Philip M. Casady, both of Santa Fe, N. Mex.

Filed Sep. 23, 1982, Ser. No. 422,012
Int. Cl.³ H02M 3/335
U.S. Cl. 363—26 **6 Claims**

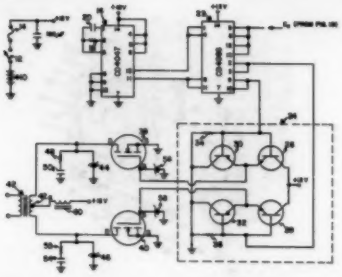
1. A dc-dc voltage converter suitable for charging rechargeable capacitor-based devices, particularly electronic camera flash lamps, comprising:

pulse train generator means operable to produce a pair of high frequency pulse train signals which are approximately 180 degrees out of phase with respect to one another;

a pair of high frequency metal oxide semiconductor field effect power transistors, said pulse train signals from said pulse train generator means being applied to the respective input gates of said high frequency power transistors;

a power transformer having a primary coil and a secondary coil, and a center tap connected to said primary coil which is connected through a center tap conductor to a source of dc current, the opposite ends of said primary coil being connected to the respective drain terminals of said power transistors;

rectifier means coupled to said secondary coil of said transformer for rectifying the alternating current produced in said secondary coil to thereby provide a dc output signal; and



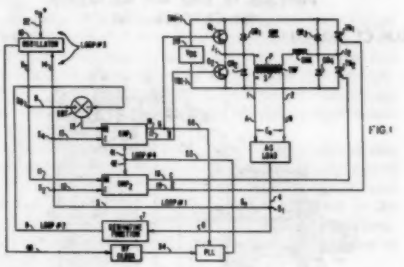
a battery-saving circuit including means for generating an internal voltage reference signal, comparator means for comparing the voltage of said reference signal with the voltage of said dc output signal of said rectifier means, and switching means controlled by said comparator operable to switch off said converter when the output voltage of said converter exceeds the voltage of said reference signal by more than a predetermined amount.

4,489,371

SYNTHESIZED SINE-WAVE STATIC GENERATOR

Andress Kernick, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 23, 1982, Ser. No. 371,089
Int. Cl.³ H02M 7/48
U.S. Cl. 363—41 **4 Claims**



1. A sine wave power generator comprising:

a DC link voltage source;

an AC load;

an inverter bridge connected between said DC link voltage and said load;

a series network in the diagonal of said bridge including an inductor and an output transformer; said output transformer being connected to said load;

a filter capacitor operative with said load;

a first comparator for alternately switching into conduction a first pair of power switches of said bridge on two opposite poles thereof and at one end of said series network;

a second comparator for alternately switching into conduction a second pair of power switches of said bridge on two

opposite poles thereof and at the other end of said series network; and

feedback means responsive to the difference between the output of said output transformer and a sine wave reference signal for controlling said first comparator successively in a driving mode and in a commutation mode in relation to one power switch of said second pair; said driving mode being effective with one of the power switches of the first pair, said commutation mode being effective with the other of the power switches of the first pair;

said first and second comparators each having an hysteresis establishing an upper and a lower limit in the response to said difference in either direction relative to said reference signal;

the driving mode for an associated one of the power switches of the first pair being operative toward and away from one of said upper and lower limits of the first comparator;

thereby to synthesize a sine wave at the output of said transformer which is representative of said sine wave reference signal;

with the additional provision of a synchronizing feedback loop responsive to a signal representative of the switching frequency of said first comparator and to a clock signal of a frequency which is an integral multiple of the frequency of said sine wave reference signal for synchronizing the operation of said first and second comparators.

4,489,372

OPTICAL GATE SIGNAL GENERATING APPARATUS AND THYRISTOR CONVERTER APPARATUS INCLUDING THE SAME

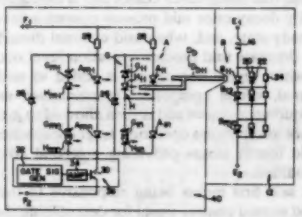
Yukihiko Hatano, Tokyo, and Tadashi Takahashi, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 25, 1983, Ser. No. 469,752

Claims priority, application Japan, Mar. 5, 1982, 57-34680

Int. Cl.³ H02H 7/125

U.S. Cl. 363—54 **14 Claims**



1. An optical gate signal generating apparatus for firing a plurality of thyristors in a thyristor converter apparatus, comprising:

means for generating an electrical gate signal;

a plurality of first light emitting elements, each being connected to receive said electrical gate signal for generating a first optical signal;

a plurality of auxiliary circuits, each including a series connection of a second light emitting element and a nonlinear element and being connected to receive said electrical gate signal for generating a second optical signal, each of said auxiliary circuits being connected in parallel with each of said first light emitting elements; and

a plurality of light guides, each having a first, a second and a third branches, each of said light guides being connected to receive said first and second optical signals at ends of said first and second branches, respectively and for guiding said first and second optical signals to an end of said third branch to produce said optical gate signal.

4,489,373

NON-DISSIPATIVE LC SNUBBER CIRCUIT

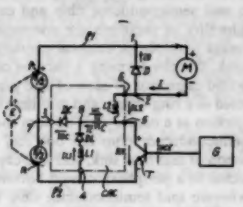
Jacques G. M. du Parc, Neuilly-Plaisance, France, assignor to Societe Nationale Industrielle Aerospatiale, France

Filed Dec. 8, 1982, Ser. No. 448,016

Claims priority, application France, Dec. 14, 1981, 81 23292

Int. Cl.³ H02H 7/122

U.S. Cl. 363—56 **6 Claims**



1. In a non-dissipative snubber circuit adapted for use in a power switching circuit of the type including a source of D.C. voltage, at least one controlled switch, a main inductance connected directly to said switch adapted to protect said switch during closure thereof, a load having a free wheel diode associated therewith, said switch, main inductance and load being connected in series across said source, and a capacitor adapted to protect said switch during opening thereof,

the improvement comprising a branch circuit including said capacitor, a first diode and an auxiliary inductance in series, mounted in parallel across said switch, with a first terminal of said capacitor connected directly to the junction of said controlled switch and said main inductance;

a second diode connected between the second terminal of said capacitor and a point of substantially fixed potential provided by means associated with said voltage source, said fixed potential being higher or lower than the potential applied to the end of said controlled switch opposite said main inductance, according to whether said latter potential is negative or positive respectively;

said first and second diodes being poled to be blocking with respect to the D.C. voltage applied by said source to the branch circuit including said diodes and said auxiliary inductance in series.

4,489,374

RECTIFYING APPARATUS FOR AUTOMOTIVE A.C. GENERATOR

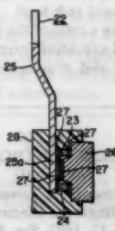
Yasuhiro Yoshida, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 14, 1982, Ser. No. 418,176

Claims priority, application Japan, Sep. 21, 1981, 56-141282[U]; Sep. 22, 1981, 56-141214[U]

Int. Cl.³ H02M 1/00

U.S. Cl. 363—145 **2 Claims**



1. A rectifying apparatus for an automotive A.C. generator comprising:

at least one rectifying device for converting an A.C. output of said generator into a direct current, each of said at least one rectifying device having a plurality of rectifiers, each of said plurality of rectifiers having a semiconductor chip and a capacitor connected in parallel therewith, thereby forming a parallel connection, and having a protecting sealer for insulating and sealing the parallel connection;

wherein said semiconductor chip and capacitor of each of said plurality of rectifiers are connected in parallel with each other between an external connection terminal and a heat sink, thereby forming a parallel connection; and

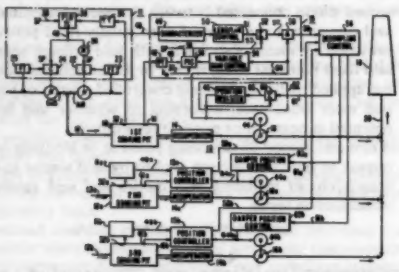
wherein said capacitor of each of said plurality of recitifiers is formed in a ring shape, and said heat sink is formed with a projection at a center on a bottom thereof, and wherein said semiconductor chip has one end connected to said projection of said heat sink, and said capacitor has one end connected to a periphery of said bottom of said heat sink, and wherein said semiconductor chip and said capacitor each have other ends which are connected to said external connection terminal, and said semiconductor chip and said capacitor are connected in parallel with each other, thereby forming a parallel connection.

4,489,375

INDUSTRIAL PROCESS CONTROL APPARATUS AND METHOD

Richard E. Putman, Penn Hills Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 12, 1982, Ser. No. 367,831
Int. Cl.³ G05B *13/02*; G06F *15/46*
U.S. Cl. 364—157 **7 Claims**



1. In a control apparatus for an industrial process having an operation control member, and with said control apparatus having a variable task load, the combination of;

controller means coupled with the control member and having a predetermined algorithm with a reference controller iteration interval and with an established gain for determining the operation of said industrial process,

means for establishing the actual controller execution interval in relation to said task load,

means for establishing a ratio of the reference iteration interval and the actual execution interval, and

means for changing said gain automatically in response to that ratio.

4,489,376

INDUSTRIAL PROCESS CONTROL APPARATUS AND METHOD

Richard E. Putman, Penn Hills Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 12, 1982, Ser. No. 367,828
Int. Cl.³ G05B *13/02*; G06F *15/46*
U.S. Cl. 364—165 **11 Claims**

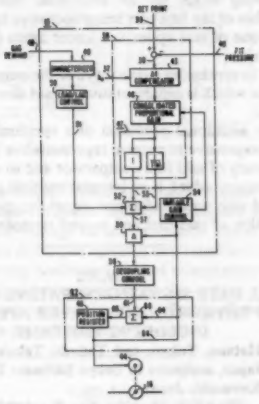
1. In apparatus for the operational control of a non-linear process having a control member determining that operation in response to an input desired operation parameter, the combination of

first means for providing feedback control of said control member in accordance with said desired operation parameter,

second means for sensing a monotonic external disturbance tending to either increase or decrease said process operation level,

third means for providing a feed-forward first control signal in accordance with said external disturbance,

fourth means responsive to and modifying said first control signal in accordance with a predetermined absolute lead/-lag characteristic such that, when said external disturbance tending to increase said process operation level



occurs, a first positive signal component is added to said first control signal, which component is maintained until after that disturbance ceases and is then allowed to gracefully decay once said process operation level approaches steady state, and, when said external disturbance tending to decrease said process operation level occurs, a second positive signal component is added to said first control signal, which component is maintained until after that disturbance ceases and is then allowed to gracefully decay once said process operation level approaches steady state, said fourth means providing a second control signal so modified,

with said first means being responsive to the provision of said second control signal for determining the operation of the control member.

4,489,377

METHOD FOR PREVENTING MACHINE COMPONENT INTERFERENCE

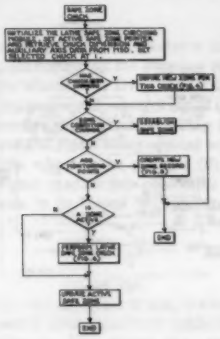
Helene B. N. Mawyer, Troy, and Derek S. Welch, Crozet, both of Va., assignors to General Electric Company, Charlottesville, Va.

Filed Sep. 7, 1982, Ser. No. 415,093
Int. Cl.³ G05B *23/02*
U.S. Cl. 364—167 **5 Claims**

1. A method for determining interference between relatively moveable components of a computer controlled industrial machine, the machine being automatically controlled by a computer program to cause relative movement between a tool on the machine and a workpiece, the computer program providing sequential blocks of data, selected ones of the data blocks comprising incremental positioning commands for causing the tool to move with respect to the workpiece, said method comprising the steps of:

(a) defining a protected zone within a sphere of operation of the machine;

(b) determining for each of the positioning commands whether relative movement between the tool and work-



piece will cause the tool to intersect a boundary of the protected zone; and

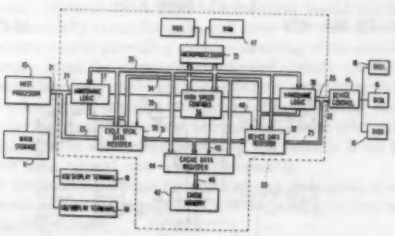
(c) inhibiting operation of the machine for any of the positioning commands having a predicted path of movement intersecting the protected zone.

4,489,378

AUTOMATIC ADJUSTMENT OF THE QUANTITY OF PREFETCH DATA IN A DISK CACHE OPERATION

Jerry D. Dixon; Gerald A. Marazas; Andrew B. McNeill, all of Boca Raton, and Gerald U. Merckel, Delray Beach, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 5, 1981, Ser. No. 270,750
Int. Cl.³ G06F *9/06, 13/00*
U.S. Cl. 364—200 **15 Claims**



11. A data processing system comprising at least one memory unit for storing a plurality of blocks of data each including n data records where n is a positive integer, a cache memory for storing a portion of the data stored in said memory unit, a host processor for requesting data stored in said memory unit, and a controller for transferring said requested data to said host processor from said cache memory if said requested data is currently stored in said cache memory and for transferring said requested data to said host processor from said memory unit if said requested data is not currently stored in said cache memory, said controller comprising:

transfer means for transferring to said cache memory from said memory unit a transfer data block containing a plurality of data records including said requested data record, said transfer means transferring to said cache memory a plurality of transfer data blocks over a predetermined period of time, said plurality of transfer data blocks having an average effective length, i.e., an average number of records per transfer data block; and

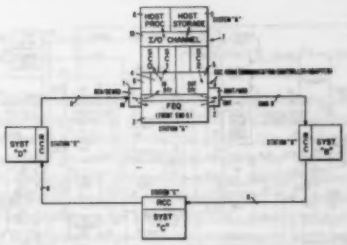
varying means for varying said average effective length of said transfer data blocks.

4,489,379

DISTRIBUTED DATA PROCESSING IN RING-STRUCTURED NETWORKS ARCHITECTED FOR FULL DUPLEX PEER-TO-PEER OPERATION OF PROCESSING STATIONS AND UNINTERRUPTIBLE TRANSFER OF LONG DATA RECORDS BETWEEN STATIONS

Charles S. Lanier, Delray Beach; Hiram M. Maxwell; Roger E. McKay, both of Boca Raton, and Leonard Weiss, Hollywood, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 25, 1982, Ser. No. 342,439
Int. Cl.³ G06F *3/04*
U.S. Cl. 364—200 **8 Claims**



1. In a data communication network in which plural data processing systems are serially interconnected in a closed ring, each system having a memory, processing logic, at least one device attachment port and at least one input/output channel for transferring information between respective ports and memory, at least one of said ports being linked to communication media forming said closed ring, each said channel being controllable by the respective system to form a plurality of co-active subchannels between a plurality of discrete memory storage areas and ports in the respective system, a method of operating any one of said systems to communicate with other said systems through its subchannels and said ring comprising:

reserving at least three subchannels in said one system exclusively for transferring information between its memory and other said systems via said ring;

operating said one system to carry out communication with another said system, in a full duplex mode, by transferring information bidirectionally between its memory and the other system via two of said three reserved subchannels and said ring; and

operating said system, while conducting said full duplex communication, to be receptive to messages from any of said other systems requiring urgent attention, and to transfer such messages into its memory via remaining one of said three reserved subchannels.

4,489,380

WRITE PROTECTED MEMORY

Richard A. Carey, Ashland, and Jerry Falk, Medway, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

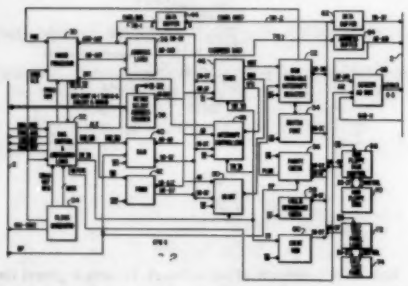
Filed Apr. 1, 1982, Ser. No. 364,381
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—200 **3 Claims**

1. A central processor unit (CPU) including a memory and a microprocessor, said CPU being operative in a write enable mode for writing information into said memory, and further

being operative in a write protect mode to cause said microprocessor to branch to a correction microprogram in response to a write memory command generated by said microprocessor, said CPU comprising:

microprocessor means for generating a plurality of address signals on an address bus, generating a plurality of data signals on a data bus and generating a plurality of bus cycle signals;

write protect means responsive to the plurality of address signals in a first state, a first of the plurality of data signals in a first state, and a first bus cycle signal for generating a first signal in a first state indicative of said write protect mode, said write protect means being responsive to the plurality of address signals in the first state, the first of the plurality of data signals in a second state, and the first bus cycle signal for generating the first signal in a second state, said write protect means being further responsive to the first signal in the first state and a second bus cycle signal for generating a second signal indicative of said memory write mode;



memory means responsive to the second bus cycle signal, the second signal for writing a data word representative of the plurality of data signals received from said data bus at an address location of said memory specified by the plurality of address signals in a second state; and

nonmaskable interrupt means responsive to the first signal and the second bus cycle signal for generating a third signal for causing said microprocessor means to interrupt a current microprogram to branch to the correction microprogram,

wherein said microprocessor means includes,

said microprocessor for generating a plurality of command signals to identify the type of bus cycle that said CPU is starting to execute;

a multiplexer responsive to the plurality of command signals in a first state for generating the second bus cycle signal; and

a bus controller responsive to the plurality of command signals in a second state for generating the first bus cycle signal.

4,489,381

HIERARCHICAL MEMORIES HAVING TWO PORTS AT EACH SUBORDINATE MEMORY LEVEL

Russell W. Lavallee, Poughkeepsie; Philip M. Ryan, Hopewell Junction, and Vincent F. Sollitto, Jr., Rhinebeck, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 6, 1982, Ser. No. 405,812

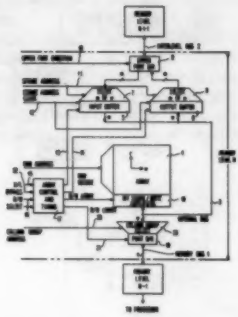
Int. Cl.³ G06F *13/00*

U.S. Cl. 364—200 **10 Claims**

1. A hierarchical memory system having a plurality of memory levels,

one or more of said levels having dual data ports, one of said ports being equipped with one or more data buffers,

each of said one or more of said levels having a data storage array having a bit width equal to the bit width of said buffers,



an internal data bus of bit width equal to said bit width of said array and said buffers for connecting said array to said buffers and to the other of said dual data ports, and

first and second bidirectional data buses for interconnecting said buffered port to a higher memory level and for interconnecting said other port to a lower level, respectively.

4,489,382

VEHICLE ANTI-SKID SYSTEM, AND METHOD OF BRAKE CONTROL

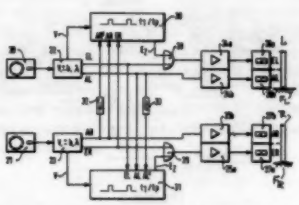
Wolf-Dieter Jonner, Beilstein; Wolfgang Korasiak, Ketsch, and Heinz Leiber, Oberriexingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 26, 1983, Ser. No. 469,741

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1982, 3209369

Int. Cl.³ B60T *8/02*

U.S. Cl. 364—426 **18 Claims**



1. Anti-brake lock or anti-skid system for a vehicle having right (R) and left (L) sides;

wheel speed sensors (**20**, **21**) associated, respectively, with right and left wheels of the vehicle and providing right and left wheel speed signals;

signal processing means (**22**, **23**) receiving the right and left wheel speed signals and generating wheel behavior signals representative of wheel acceleration, deceleration, and wheel slip (+b, −b, λ);

right and left wheel brake control circuits (**24***a*, **24***b*; **25***a*, **25***b*) connected to and controlled by the signal processing means and controlling wheel brake pressure (P), in accordance with the differential values of right and left wheel behavior, as represented by the wheel behavior signals, and preventing occurrence of vehicle yaw by holding the braking pressure (P_L) of the wheel having the higher road friction coefficient of the wheels on the two sides of the

vehicle constant, when the brake pressure (P_R) of the wheel having the lower road friction coefficient is decreased and held constant and 2.) increasing it (P_L) thereafter in synchronism with a pulsed increase of the braking pressure (P_R) of the wheel having the lower road friction coefficient

and comprising,

means for decreasing the braking distance comprising

means (32, 33, 38) for timing the duration of pressure drop (P_R, 13) at the wheel of the lower road friction coefficient and generating an override control signal (E_Z) if said time duration exceeds a predetermined timing interval (t_0),

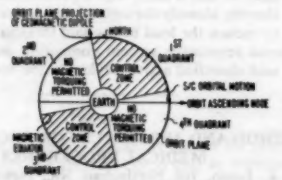
said override control signal being applied to control pulsed increase of the wheel brake pressure (P_L) in the wheel having the higher road friction coefficient until the wheel brake pressure is increased in synchronism for both wheels.

4,489,383

CLOSED-LOOP MAGNETIC ROLL/YAW CONTROL SYSTEM FOR HIGH INCLINATION ORBIT SATELLITES

George E. Schmidt, Jr., Vincentown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 16, 1981, Ser. No. 312,276
Int. Cl.³ G06F 15/50; B64G 1/32
U.S. Cl. 364—434 4 Claims



1. A closed-loop magnetic torquing system in a high inclination earth oriented orbiting pitch momentum biased satellite for automatically controlling the roll error and yaw error of the satellite and/or providing nutation damping of the satellite, to thereby orient the pitch axis to a desired attitude normal to the orbit plane, said pitch axis being colinear with the momentum vector of the satellite, said high inclination orbit being such that the geomagnetic field lies generally in the orbit plane and the positive momentum vector of the satellite is on the positive orbit normal, said system comprising:

roll error sensing means for generating a first signal representing a roll attitude deviation of the pitch axis from said desired attitude;

magnetic torquing means suitably oriented in the body of the satellite for producing, when energized, a magnetic dipole moment, which dipole moment is parallel to the pitch axis of the satellite;

means for sensing the satellite position in orbit for providing a second signal indicative of when said satellite is in either of two spaced quadrants 1 and 3 of its orbit, each lying generally between a first plane in which the magnetic equator lies, and a second plane normal to the orbit plane and passing through the geomagnetic poles, said quadrants 1 and 3 comprising parts of the orbit in which the velocity vector of said satellite is toward said second plane from the direction of said first plane, said means also providing a third signal indicative of when said satellite has crossed said second plane; and

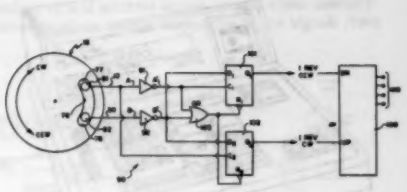
means responsive to said first, second, and third signals for energizing said magnetic torquing means solely when said satellite is in said quadrants 1 and 3 of its orbit.

4,489,384

ELECTRO-OPTICAL SENSOR FOR WATT-HOUR METER

James R. Hurley, Brookfield, and Clyde Gilker, Milwaukee, both of Wis., assignors to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Mar. 1, 1982, Ser. No. 353,676
Int. Cl.³ G01R 27/26, 11/36; G08C 19/36
U.S. Cl. 364—483 4 Claims



1. An electronic watt-hour meter, comprising: an electro-optical watt-hour sensor, adapted to be coupled to a consumer's connection to a source of electric power, for sensing the voltage supplied to and the current drawn by the consumer's electric load and for producing output signals indicative of a quantity of watt-hours of power utilized by the consumer; and power supply means for supplying D.C. power to said electro-optical watt-hour sensor from said consumer's connection, said electro-optical sensor comprising

a yoke having a voltage core and at least one current core,

an induction disk which is mounted for rotation on said yoke and which has at least one aperture therein,

a voltage coil on said voltage core and a current loop on said at least one current core for causing, when energized, rotation of said induction disk,

light generating means on one side of said disk, said light generating means comprising first and second light emitting devices,

light receiving means, on the other side of said disk, for generating an output signal in response to light passing through said aperture, said light receiving means comprising discrete first and second photosensors and,

direction sensing means, coupled to said light receiving means, for sensing the direction of rotation of said disk, said direction sensing means comprising

an up/down counter for counting revolutions of said induction disk, said up/down counter having a down input, an up input and outputs for indicating the quantity of electrical power consumed over an interval of time,

a first rising edge triggered flip flop having its output coupled to said down input of said up/down counter,

a second rising edge triggered flip flop having its output coupled to said up input of said counter and its clock input coupled to the output of said first photosensor,

a first inverting amplifier having its output coupled to the clock input of said first flip flop and its input coupled to the output of said first photosensor,

a second inverting amplifier having its input coupled to said second photosensor and its output coupled to the data input of said first flip flop and to the data input of said second flip flop, and

a NOR gate having a first input coupled to the output of said first inverting amplifier, a second input coupled to the output of said second inverting amplifier and an output coupled to the reset inputs of each of said flip flops.

4,489,385

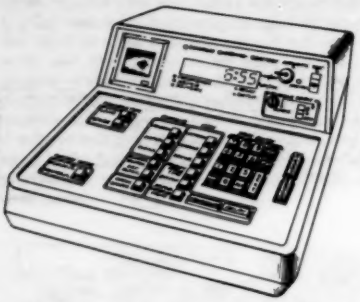
METHOD AND APPARATUS FOR CONTROLLING DISTRIBUTED ELECTRICAL LOADS

Edward B. Miller, West Warwick, R.I., and Charles W. Eichelberger, Schenectady, N.Y., assignors to General Electric Company, Bridgeport, Conn.

Division of Ser. No. 089,478, Oct. 30, 1979, abandoned. This application Nov. 23, 1981, Ser. No. 324,372

Int. Cl.³ G01R *21/00*; G06F *15/06*

U.S. Cl. 364—493 **16 Claims**



1. In a programmable system for controlling plural distributed electrical loads including plural relays, each connected to control a respectively corresponding one of said plural distributed electrical loads; plural remotely located data receiving and decoding circuits connected to control a predetermined subset of said relays in response to received and decoded data signals; and a programmable central controller connected to provide said data signals to each of said receiving and decoding circuits and normally controlling said relays in a pre-programmed time-dependent sequence; the improvement comprising:

pattern data storage structure for storing pattern data representing pattern identifications and definitions of plural patterns of condition states,

sector data storage structure for storing sector identification and definition data representing user selected sector subsets of said relays assigned as desired to respectively corresponding different sectors, and

schedule data storage structure for storing schedule data including sector identifications and pattern identifications representing the time-dependent sequence in which a desired sector is to be controlled so as to establish each of its associated relays at a state corresponding to that defined in the identified pattern data,

said central controller being connected to all of said data storage structures and adapted to execute the desired schedule of relay control as defined by said schedule data, sector data and pattern data.

4,489,386

DEVICE CONTROL SYSTEM

Joseph A. Breddan, Boulder, Colo., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 3, 1982, Ser. No. 345,341

Int. Cl.³ G06F *15/56*; G05B *15/00*

U.S. Cl. 364—493 **25 Claims**

14. A device control system for controlling the operation of a plurality of devices which are connected to said device control system comprising:

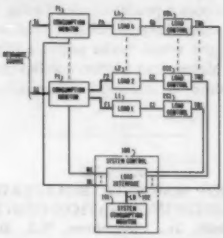
means for monitoring the load presented by the active ones of said devices;

means responsive to said monitoring means for identifying which of said active devices are to be placed in an inactive state to prevent the overall load from exceeding a defined limit including:

means responsive to said monitoring means for storing a record of the load presented by the active ones of said devices over n of the most recent intervals of time;

means responsive to said storing means for producing a sum of the loads for each of n time periods, where i is an integer which varies from 1 to n, comprising:

means responsive to said storage means for replacing the record of the load presented during the (n−i)th least recent one of said intervals of time with the load estimated to be presented during the i-th successive future interval of time,



means responsive to said replacing means for summing the (n−i) remaining indications and the i estimations,

means responsive to said summing means for comparing each of said n sums with a predetermined threshold to thereby identify the ones of said active loads to be shed to reduce the load below said threshold;

means responsive to said comparing means for placing said identified active devices in the inactive state.

4,489,387

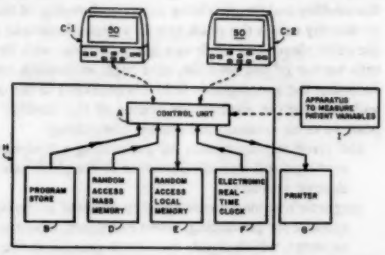
METHOD AND APPARATUS FOR COORDINATING MEDICAL PROCEDURES

David E. Lamb, 708 Nottingham Rd., Newark, Del. 19711; William B. Long, 2747 Second Ave., Apt. J., San Diego, Calif. 92103, and William J. Sacco, 803 Jackson Blvd., Bel Air, Md. 21014

Filed Aug. 20, 1981, Ser. No. 294,671

Int. Cl.³ G06F *15/42*

U.S. Cl. 364—514 **29 Claims**



1. A system for coordinating the actions of at least two persons upon a common patient comprising:

at least two input-output stations, located in proximity to each other, one for use by a first one of said persons and one for use by a second of said persons, each of said stations having (a) input means permitting the person complementary to that station to enter medical data and (b) output means for communicating information to the person complementary to that station, and

control means responsive to the medical data from each said input means for giving coordinated different instructions to said first and second persons based on said data via said output means that are respectively complementary to the first and second persons,

whereby the instructions given by the plural output means

for treatment of the patient by said persons are in a coordinated and desired sequence that depends on the data on the patient that is fed into the system.

4,489,388

PLOT GENERATOR

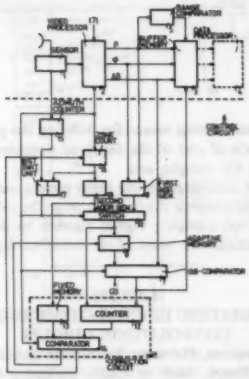
Gerrit DeGroot, Hengelo, and Alexander H. Slag, Haaksbergen, both of Netherlands, assignors to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

Filed Oct. 13, 1981, Ser. No. 310,582

Claims priority, application Netherlands, Oct. 29, 1980, 8005923

Int. Cl.³ G01S 7/04

U.S. Cl. 364—517 **8 Claims**



3. A plot generator including a video processor for producing target angle, range and azimuth extent data in response to the detection by a sensor of respective targets in an area under surveillance, a buffer memory coupled to the video processor for receiving the data, and a control circuit for selectively controlling the transfer of said data through the buffer memory to a data processor, said control circuit comprising:

(a) an adaptive memory for containing distinct azimuth extent thresholds for a plurality of range-azimuth zones into which the area is divided;

(b) a first address generator, coupled to the video processor and to the adaptive memory, for producing an address control signal representing the respective zone encompassing the range and angle defined by said data, and for applying said address control signal to the adaptive memory; and

(c) a first comparator, coupled to the video processor, the adaptive memory and the buffer memory, for comparing the azimuth extent data produced by the video processor with the azimuth extent threshold stored in the adaptive memory for the zone represented by the address control signal, said comparator means applying a transfer signal to the buffer memory if said azimuth extent data is at least equal to said azimuth extent threshold.

4,489,389

REAL TIME VIDEO PERSPECTIVE DIGITAL MAP DISPLAY

Paul B. Beckwith, Indialantic; Kent P. Bascle, and Jeffrey B. Pearce, both of Melbourne, all of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Oct. 2, 1981, Ser. No. 308,166

Int. Cl.³ G06F 3/153; H04N 7/18

U.S. Cl. 364—522 **42 Claims**

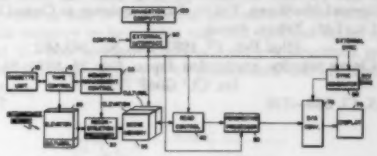
12. A system for generating a perspective display of terrain over which a vehicle is moving, comprising:

a scene memory for storing digital data representing a two-dimensional elevation terrain pattern which is addressable in relation to the coordinate position of each elevation point with respect to a selected geographical orientation,

signal supplying means for providing signals representing the heading angle of said vehicle with respect to said selected geographical orientation, the angle of the desired perspective display with respect to said two-dimensional elevation terrain pattern, and the elevation and current position of said vehicle with respect to said terrain;

read-out control means, responsive to the signals from said signal supplying means, for reading elevation data for respective ones of said elevation points out of said scene memory through generation of address signals and the application of said address signals to said scene memory;

perspective transform means responsive to the signals from



said signal supplying means for transforming the address of each point read out of said scene memory from the address of that point in the scene memory to the address of a respective pixel position in said perspective display;

display memory means for storing the elevation data read out of said scene memory in a matrix of memory positions forming storage locations corresponding to said transformed addresses; and

display means for displaying the elevation data stored in said display memory means to produce said perspective display.

4,489,390

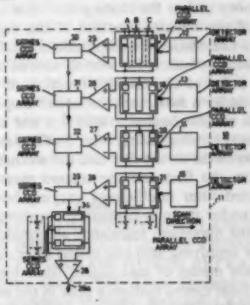
SPATIAL FILTER SYSTEM

Ronald R. Parenti, Acton, and William E. Kelcher, Burlington, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Mar. 20, 1981, Ser. No. 245,894

Int. Cl.³ G01S 7/30

U.S. Cl. 364—724 **6 Claims**



1. A spatial filter system for image data processing to enhance an image, the system comprising:

A. a linear array of detector elements, each detector element generating a column of data values, the array being adapted for scanning along one dimension to generate a succession of rows of data values thereby defining a matrix having a plurality of columns and rows:

B. a first filter means connected to the array to receive the rows of data values in succession and process the data values of each row in parallel to generate a first-filtered value matrix;

C. a first summing means connected to the first filter means for summing the data values of the first-filtered value

matrix to generate a succession of summed data columns from said first-filtered value matrix;

D. a second filter means connected to the first summing means for filtering the summed columns in succession to generate a second filtered value matrix; and

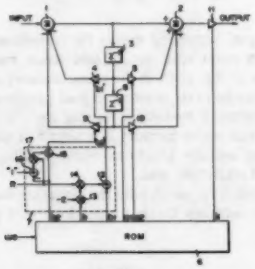
E. a second summing means for summing the data values of the second-filtered value matrix, wherein the first and second filter means are chosen such that their multiplicative product form a two-dimensional spatial filter of the original matrix of data values.

4,489,391

DIGITAL FILTER APPARATUS HAVING A RESONANCE CHARACTERISTIC

Shigenori Morikawa, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Feb. 17, 1982, Ser. No. 349,682
Claims priority, application Japan, Feb. 26, 1981, 56-27912
Int. Cl.³ G06F 7/38
U.S. Cl. 364—724 **7 Claims**



1. A digital filter apparatus having a resonance characteristic, comprising:

digital filter means arranged to have a certain transfer function and including operation means for implementing the transfer function on an input signal and for providing a corresponding filter output signal;

first memory means for storing first data corresponding to poles of the transfer function of the digital filter means under a non-resonance amplitude condition;

second memory means for storing second data corresponding to poles of the transfer function of the digital filter means under a maximum resonance amplitude condition;

arithmetic means coupled to said first and said second memory means for calculating filter coefficients for the transfer function based on the first and the second data when read out from the first and the second memory means, said calculated filter coefficients varying between those obtained under the non-resonance amplitude condition and under the maximum resonance amplitude condition; and

means for supplying said calculated filter coefficients to the operation means of said digital filter means so that said digital filter means realizes a peak in the amplitude characteristic of the transfer function of said digital filter means in accordance with said calculated filter coefficients.

4,489,392

ORTHOGONALIZER FOR INPHASE AND QUADRATURE DIGITAL DATA

Bernard L. Lewis, 13318 Fort Washington Rd., Oxon Hill, Md. 20022

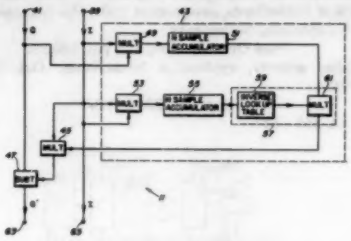
Filed Jun. 9, 1982, Ser. No. 386,828
Int. Cl.³ G01S 9/42
U.S. Cl. 364—724 **6 Claims**

1. An orthogonalizer comprising:

input means for receiving a series of complex digital numbers, each number having correlated real and imaginary parts;

weight-establishing means connected to the input means for establishing a weight which is a measure of the correlation;

a first multiplier connected to the input means and to the



weight-establishing means for forming the product of one of the parts of one of the received complex digital numbers with the weight; and

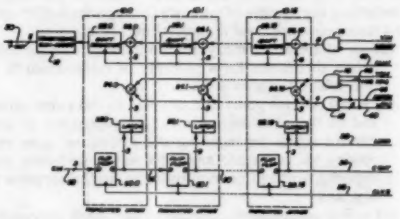
a subtractor connected to the input means and to the multiplier for subtracting the product from the other part of the one received complex digital number to decorrelate the real and imaginary parts of the complex digital number.

4,489,393

MONOLITHIC DISCRETE-TIME DIGITAL CONVOLUTION CIRCUIT

Steven K. Kawahara, Hermosa Beach, and James G. Peterson, Manhattan Beach, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Dec. 2, 1981, Ser. No. 326,789
Int. Cl.³ G06F 7/38
U.S. Cl. 364—728 **16 Claims**



1. A monolithic discrete-time digital convolution circuit, comprising:

a pluralith (N) of storage circuits for holding N respective values of a first function;

a like plurality (N) of multipliers having first inputs connected to respective ones of said storage circuits and second inputs connected together to receive N successive values of a second function, and providing output signals indicative of the products of the respective values of the first function and the successive values of the second function;

a like plurality (N) of shift registers;

a like plurality (N) of adders having first inputs connected to receive products from respective ones of said multipliers, outputs connected to respective ones of said shift registers, and second inputs connected to receive accumulated data from adjacent ones of said shift registers, said adders and shift registers being connected together in a chain in which each adder combines a multiplier product with a cumulative sum derived from an adjacent adder in the

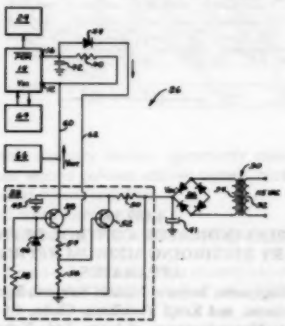
chain, and the final adder in the chain produces a sucession of N accumulated product summations proportional to the discrete values of the convolution of the first and second functions.

4,489,394

MICROPROCESSOR POWER ON RESET SYSTEM

Arthur N. Borg, Lake Forest, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Apr. 21, 1982, Ser. No. 370,316
Int. Cl.³ G06F *1/00*
U.S. Cl. 364—900 9 Claims



1. For a microprocessor energized by a supply signal and initialized by a reset signal wherein said reset signal must be applied to said microprocessor subsequent to the application of said supply signal thereto for proper initialization thereof, a system for sequentially applying first said supply signal and then said reset signal to said microprocessor, said system comprising:

a DC power supply for generating said supply and reset signals;

voltage regulation means coupled to said power supply for controlling the voltages of the supply and reset signals applied to said microprocessor;

first and second circuit means coupling said voltage regulation means and said microprocessor for respectively applying said supply and reset signals thereto, said second circuit means including time delay means for delaying the transmission of said reset signal to said microprocessor for a predetermined time period; and

grounded conductive means responsive to the supply signal of said DC power supply and coupling said second circuit means to said voltage regulation means for instantaneously grounding said second circuit means in rapidly discharging said reset signal to zero voltage when the supply signal of said DC power supply goes to zero.

4,489,395

INFORMATION PROCESSOR

Fumitaka Sato, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 73,386, Sep. 7, 1979, abandoned. This application May 6, 1982, Ser. No. 375,702
Claims priority, application Japan, Sep. 11, 1978, 53-110703; Oct. 31, 1978, 53-133229
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—900 10 Claims

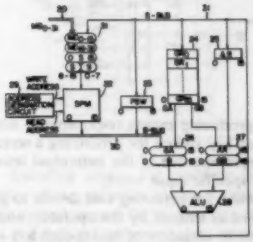
1. In an information processor including a main memory having a plurality of memory locations for storing and reading operand information and program instruction information, an N bit architecture central processing unit, and a memory bus for transferring operand information and program instruction information from the main memory to the central processing unit; the improvement comprising said memory bus having a width of 2N bits, and said central processing unit comprising:

a scratch pad memory including at least one operand buffer having an N bit width and at least two instruction buffers each having an N bit width;

a microprogram control section including at least one microprogram which is selectable based on information stored in said scratch pad memory;

an N bit data bus connected to said scratch pad memory and said microprogram control section;

first means for causing N bit operand information to be read from said main memory onto the memory bus and 2N bits of information including instructions to be read at one time from said main memory onto the memory bus, and for causing said N bit operand information read from the main memory to be written into said operand buffer and said 2N bits of information including instructions read from the main memory to be written into said instruction buffers;



a selector connected between said memory bus and said scratch pad memory; and

second means for causing said selector to select N bits of said memory bus when said first means causes N bit operand information to be read onto the memory bus from said main memory to enable said N bit operand information read from said main memory to be written into said operand buffer, and for causing said selector to select 2N bits of said memory bus when said first means causes 2N bits of information including instructions to be read at one time onto the memory bus from said main memory, N bits of said memory bus being selected to enable N bits of said 2N bits of information on said memory bus read from said main memory to be written into one of said instruction buffers and a further N bits of said memory bus being selected to enable a further N bits of said 2N bits of information on said memory bus read from said main memory to be written into the other of said instruction buffers.

4,489,396

ELECTRONIC DICTIONARY AND LANGUAGE INTERPRETER WITH FACULTIES OF PRONOUNCING OF AN INPUT WORD OR WORDS REPEATEDLY

Shintaro Hashimoto, Ikoma, and Akira Tanimoto, Kashihara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 95,081, Nov. 16, 1979,. This application Jun. 24, 1983, Ser. No. 507,951
Claims priority, application Japan, Nov. 20, 1978, 53-160223[U]
Int. Cl.³ G06F *3/16*
U.S. Cl. 364—900 1 Claim

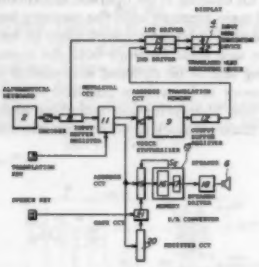
1. In an electronic dictionary and language translator device comprising input means for receiving one or more words in a first language input by an operator, data processing means for determining translated or equivalent words corresponding to the words input by an operator, and output means for communicating the translated or equivalent words to the operator, the combination comprising:

entering means for entering a specific input word into said device;

a translation key switch;

translation means connected to said entering means and responsive to actuation of said translation key switch for translating said specific input corresponding word into a different word;

display means for displaying both said corresponding word and said specific input word;



audible sound producing means responsive to actuation of said translation key switch for producing a series of audible sounds representative of the individual letters which comprise the specific input word;

a speech key switch for actuating said device to pronounce said input word as entered by the operator; and

means responsive to actuation of said speech key switch for audibly pronouncing the entire specific input word entered by the operator subsequent in time to the production of the series of audible sounds representative of the individual letters which comprise the specific input word.

4,489,397

CHAIN CONFIGURABLE POLYCELLULAR WAFER SCALE INTEGRATED CIRCUIT

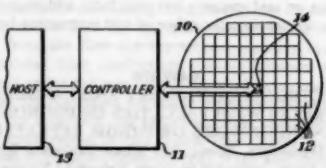
Kin H. Lee, Stockport, England, assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 293,800, Aug. 18, 1981, abandoned. This application Jan. 24, 1984, Ser. No. 573,588

Claims priority, application United Kingdom, Aug. 21, 1980, 8027212

Int. Cl.³ G06F *1/00*

U.S. Cl. 364—900 **13 Claims**



1. A wafer scale integrated circuit having a plurality of adjacent data processing cells on a common wafer substrate, the circuit receiving an external synchronizing signal, said cells transfering data and commands between them, said cells comprising:

a cell address decoding means receiving said commands, said address decoding means operable to monitor a cell address in each said command and provide an output indicative that said command has reached the cell address;

command decoder means receiving said commands for monitoring an indication portion of said command, and responding to the receipt of said output of said cell address decoding means to provide an output indicative of which one out of a plurality of instructions is selected;

at least one data processing element coupled to receive the output of said command decoder means and responding to the selected instruction to act upon said data, said data processing element having fixed address storage locations; and,

transfer means receiving said data and commands and coupled to provide said data and commands to said cell address decoding means and said command decoder means, said transfer means monitoring the output of said cell address decoding means and responding to the absence of an output to provide functional coupling between neighboring cells for said data and commands.

4,489,398

ADDRESS INDICATOR CONTROL DEVICE IN A ROTARY RECORDING MEDIUM REPRODUCING APPARATUS

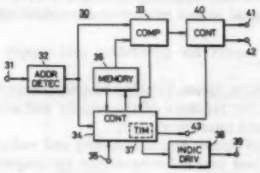
Hiroyuki Sugiyama, Isehara; Masaki Sakurai; Ryozo Abe, both of Yokohama, and Kenji Yoshihara, Chiba, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jun. 11, 1982, Ser. No. 387,550

Claims priority, application Japan, Jun. 15, 1981, 56-91917

Int. Cl.³ G11B *21/02*; H04N *5/78*

U.S. Cl. 369—32 **6 Claims**



1. An address indicator control device in a rotary recording medium reproducing apparatus having a reproducing transducer for reproducing a rotary recording medium recorded with at least two kinds of address signals together with an information signal, means for transferring said reproducing transducer to a set address position on said rotary recording medium reproducing apparatus to carry out a search operation, and indicator means for indicating an address, said address indicator control device comprising:

indication mode setting means for setting the kind of address to be indicated on said indicator means;

search address setting means for setting the kind of address to be searched and the address value;

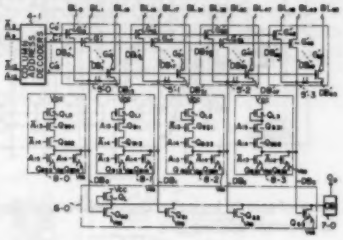
address signal separation means for separating an address signal from a signal reproduced from said rotary recording medium by said reproducing transducer; and

control means for indicating an address of the kind and value set by said search address setting means on said indicator means regardless of the setting by said indication mode setting means, at least during the search operation of said reproducing transducer, and until a predetermined time has elapsed from the start of said search operation when the duration of said search operation is shorter than said predetermined time.

4,489,399
READ-ONLY MEMORY DEVICE

Yasuo Suzuki, Yokohama, and Hiroshi Hirao, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 3, 1982, Ser. No. 354,500
Claims priority, application Japan, Mar. 6, 1981, 56-32125
Int. Cl.³ G11C *7/00*
U.S. Cl. 365—104 19 Claims



1. A read-only memory device, operatively connected to receive first and second column address signals, comprising:

first and second power supplies;

a plurality of word lines;

a plurality of groups of bit lines intersecting said plurality of word lines;

a plurality of read-only memory cells operatively connected at the intersections of said plurality of word lines and said bit lines;

a plurality of data bus lines, respectively, operatively connected to said plurality of groups of bit lines and each having a potential, the number of said data bus lines being the same as that of said groups of bit lines;

a plurality of groups of switching gates, each group of said switching gates operatively connected between a respective one of said groups of bit lines and a respective one of said data bus lines;

a plurality of first column decoders, operatively connected to said switching gates and operatively connected to receive the first column address signal, for selecting one switching gate within each said group of switching gates in accordance with the first column address signal, so as to turn on said selected switching gate;

a plurality of second column decoders, each operatively connected to said first and second power supplies and to a respective one of said data bus lines and operatively connected to receive the second column address signal, for selecting a respective one of said data bus lines in accordance with the second column address signal, so as to charge said selected data bus line by connecting said selected one of said data bus lines to said first power supply;

a sense amplifier operatively connected to said plurality of data bus lines; and

an output buffer operatively connected to said sense amplifier.

4,489,400
SERIALLY BANKED READ ONLY MEMORY

Ebbin R. Southerland, Jr., Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

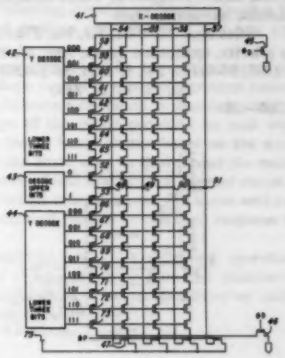
Filed Mar. 1, 1982, Ser. No. 353,783
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—104 4 Claims

1. A read-only memory comprising:

a first plurality of branches divided into a first group and a second group, with each branch including a plurality of data transistors serially connected together from a first data transistor to a last data transistor with each data transistor being coded to represent a predetermined logic state;

a plurality of node means for electrically joining a member of the first group of branches to a member of the second group of branches at a member node means of the plurality of node means to form a plurality of dual branch sets thereby;

precharge circuit means for precharging the plurality of node means;



address decoding means for enabling an addressed data transistor of the plurality of data transistors;

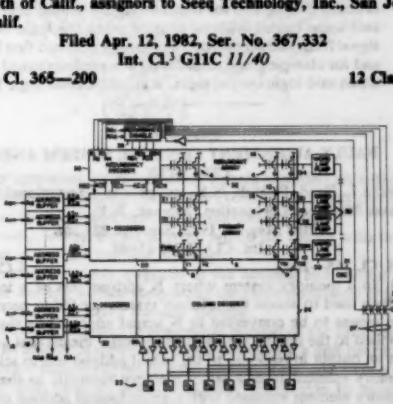
discharge circuit means for discharging the plurality node means through the addressed data transistor when coded to represent a preselected logic state; and

evaluation circuit means for evaluating the plurality of nodes.

4,489,401
ELECTRICAL PARTITIONING SCHEME FOR IMPROVING YIELDS DURING THE MANUFACTURE OF SEMICONDUCTOR MEMORY ARRAYS

George Smarandoiu, Palo Alto, and George Perlegos, Fremont, both of Calif., assignors to Seeq Technology, Inc., San Jose, Calif.

Filed Apr. 12, 1982, Ser. No. 367,332
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—200 12 Claims



11. In a semiconductor memory having an array of storage devices together with a series of address buffers which respectively receive the address bits of an address signal and which subsequently generate output signals for use in accessing and enabling an individual storage device in accordance with the values of the address bits, the improvement comprising:

circuit means for locking the output signals from a selected

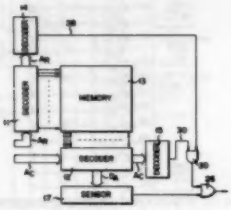
one of the address buffers into one of two permanent states such that all storage devices having a common value for the address bit associated with the selected address buffer are electrically isolated and effectively removed from the semiconductor memory.

4,489,402

SEMICONDUCTOR MEMORY DEVICE

Shinji Saitoh; Junichi Miyamoto, and Kazuaki Ichinose, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 22, 1982, Ser. No. 370,914
Claims priority, application Japan, Apr. 25, 1981, 56-63005; May 29, 1981, 56-82115; Jul. 9, 1981, 56-106265
Int. Cl.³ G11C 7/00
U.S. Cl. 365—200 **1 Claim**



1. A semiconductor memory device comprising:
a memory for storing data;
a first decoder circuit for receiving an address signal to decode and designate an address of said memory;
a sense circuit for sensing data stored in said memory at said designated address;
a second decoder circuit for receiving said address signal and for producing a logic output signal at a first logic level if said address signal is for selecting a correct bit cell in said memory and for producing an output signal at a second logic level if said address signal is for selecting an error bit cell in said memory; and
logic circuit means for receiving the data sensed by said sense circuit and the logic output signal from said second decoder circuit, and for transmitting the sensed data from said sense circuit without change when the logic output signal from said second decoder circuit is at said first level, and for clamping said sensed data at a predetermined level when said logic output signal is at said second logic level.

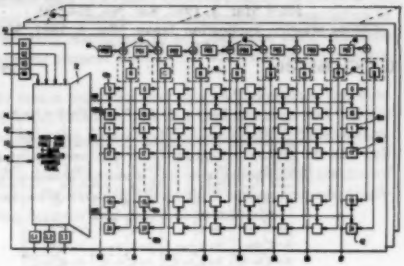
4,489,403

FAULT ALIGNMENT CONTROL SYSTEM AND CIRCUITS

George L. Bond, Fishkill, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 24, 1982, Ser. No. 381,266
Int. Cl.³ G11C 11/40
U.S. Cl. 365—200 **6 Claims**

1. In a memory system where N address bits of a logical address used to access the memory system are fed to permutation means to be converted to N actual address bits that are supplied to the inputs of an address decoder means that generates an output in response to the actual address bits to select a memory element from a set of memory elements so that the memory element accessed with a given logical address can be changed by changing permutation bits supplied to the permutation means, a modified permutation means and address decoder means combination comprising:
address decoder means for decoding actual N address bits into 2^N outputs,
permutation bit means for supplying greater than N permutation bits; and
extended permutation means responsive to said N logical address bits and said greater than N permutation bits for providing any one of greater than 2^N possible permutations of said N logical address bits to said decoder means as N actual address bits.

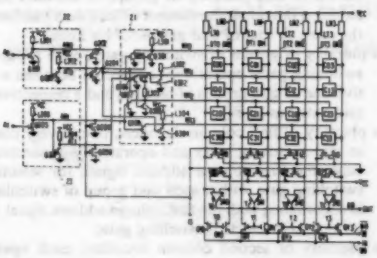


4,489,404

MEMORY DEVICE

Nobuyuki Yasuoka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 20, 1983, Ser. No. 506,080
Claims priority, application Japan, Jun. 18, 1982, 57-105757
Int. Cl.³ G11C 7/00
U.S. Cl. 365—230 **10 Claims**



1. A memory device comprising a plurality of word lines, a plurality of digit line pairs, each of said digit line pairs including first and second digit lines, a plurality of static type memory cells arranged at the intersections of said word lines and said digit line pairs, means for receiving address signals, a word decoder having a plurality of output terminals each coupled to corresponding one of said word lines, means for receiving a control signal, first means coupled to said word decoder for forcibly set all the output terminals of said word decoder at a selection level irrespectively of said address signals in response to said control signal, and second means for forcibly setting all the first digit lines of said digit line pairs at the same predetermined logic state in response to said control signal.

4,489,405

TALKING DEPTH SOUNDER

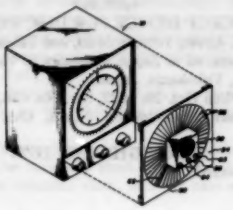
Robert K. Tendler, 19 Lawrence Ave., Newton, Mass. 02167

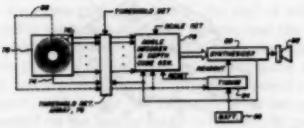
Filed Aug. 30, 1982, Ser. No. 412,839
Int. Cl.³ G01S 7/56
U.S. Cl. 367—116 **18 Claims**

1. Apparatus for converting a depth sounder having an

analog depth indication into one in which depth is periodically called out comprising:

means for sensing the analog depth indication;





means for converting the indication into a number; and,

means for converting the number into a speech equivalent.

4,489,406

OPTICAL MEMORY SYSTEM HAVING A SHORT SEEK CAPABILITY

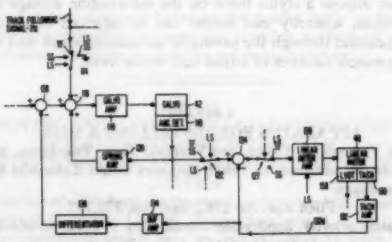
Der-Chang Hsieh, Thousand Oaks, and Edward V. LaBudde, Newbury Park, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Feb. 17, 1982, Ser. No. 349,534

The portion of the term of this patent subsequent to Feb. 14, 2001, has been disclaimed.

Int. Cl.³ G11B *7/00*

U.S. Cl. 369—32 **8 Claims**



1. In a high density data storage system including a recording medium having a plurality of spaced tracks, the combination comprising:

means including a radiation beam for reading data recorded in a track on said medium;

means providing for relative movement of said radiation beam along said track;

means for deriving a track following signal indicative of the deviation of said radiation beam from a track being followed;

first position control means coupled to said track following signal for moving said radiation beam to provide a track following operation such that said radiation beam follows said track;

detecting means for detecting the movement of said first position control means during said track following operation;

second position control means coupled to said detecting means and operating concurrently with said first position control means during said track following operation, said second position control means being responsive to said detecting means for providing movement of said first position control means so as to reduce the movement required thereby for maintaining said radiation beam following said track;

means for disabling said track following operation when said beam is to be moved to a different track by disconnecting the coupling between said first position control means and said track following signal as well as the coupling between said second position control means and said detecting means;

waveform generating means for providing a signal of predetermined shape to said first position control means when said track following operation is disabled, the predetermined shape of the signal provided by said waveform generating means being chosen based on the number of tracks that the beam is to be moved and the mechanical characteristics of said first position control means so that said first position control means will move said radiation beam the required number of tracks in response thereto; and

means for enabling said track following operation after completion of movement by said first position control means in response to the signal provided by said waveform generating means.

4,489,407

DISK REPRODUCING APPARATUS

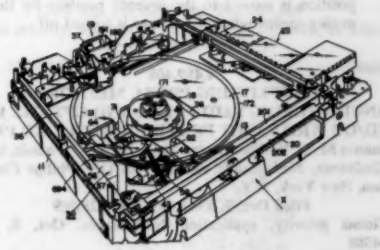
Majime Kiguchi, Fukaya, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jul. 2, 1982, Ser. No. 394,724

Claims priority, application Japan, Jul. 7, 1981, 56-104973

Int. Cl.³ G11B *3/00*

U.S. Cl. 369—77.2 **10 Claims**



1. An apparatus for reproducing signals recorded on a disk which is kept in a casing at all times except when being reproduced in the apparatus, said apparatus comprising:

a housing having a port through which the casing with the disk is inserted into the housing;

a turntable rotatably disposed in the housing and having a disk loading surface supporting the outer peripheral edge of the disk to carry the disk thereon;

a disk cradle disposed at the central portion of the turntable to be able to move up and down and having a disk bearing surface supporting the central portion of the disk to carry the disk thereon, said disk cradle being able to move between a first position where the disk bearing surface is located above the disk loading surface and substantially flush with said port, and a second position where the disk bearing surface is located below the disk loading surface so that the disk supported on the disk bearing surface is laid on the turntable;

holding means located substantially flush with said port and capable of moving between a third position where the holding means holds the outer peripheral portion of the

disk and a fourth position where the disk is released from the hold;

a drive source for supplying a driving force;

drive means connected with the holding means and the disk cradle to drive them both by means of the driving force from the drive source, said drive means raising the disk cradle to the first position and then shifting the holding means to the third position when the power is turned on, lowering the disk cradle to the second position while keeping the holding means in the third position as the casing is inserted, raising the disk cradle to the first position as the casing is drawn out, shifting the holding means to the fourth position and then lowering the disk cradle to the second position in response to an instruction for the start of reproducing operation, and raising the disk cradle to the first position and then shifting the holding means to the third position in response to an instruction for the end of the reproducing operation; and

a clutch mechanism disposed between the drive means and the drive source, said clutch mechanism connecting the drive source with the drive means, thereby being capable of transmitting the driving force when the power is turned on, and said clutch mechanism disconnecting the drive source with the drive means, thereby causing the drive means to shift the holding means in the third position to the fourth position and then to lower the disk cradle in the first position to the second position when the power is turned off, and wherein said drive means includes:

(i) a first member capable of moving between a fifth position to locate the disk cradle and the holding means in the first and third positions, respectively, and a sixth position to locate the disk cradle and the holding means in the first and fourth positions, respectively, and between the sixth position and a seventh position to locate the disk cradle and the holding means in the second and fourth positions, respectively; and

(ii) first urging means for urging the first member to move from the fifth position to the seventh position via the sixth position, whereby the first member in the fifth position is moved to the seventh position by the first urging means when the power is turned off.

4,489,408

BEAM-SPLITTING PRISM, METHOD OF MANUFACTURING SAID PRISM, AND OPTICAL READ AND/OR WRITE UNIT PROVIDED WITH SAID PRISM

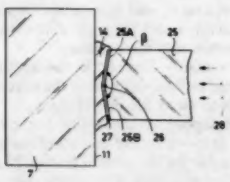
Johannes M. G. Verhoeven, and Herman M. A. Amendt, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 9, 1981, Ser. No. 328,969

Claims priority, application Netherlands, Oct. 8, 1981, 8104588

Int. Cl.³ G11B 7/00

U.S. Cl. 369—112 **7 Claims**



1. A beam-splitting prism comprising an entrance surface for a radiation beam, a beam-splitting surface and and exit surface for a radiation beam which has been deviated inside the prism, which entrance surface and exit surface form part of prismatic glass elements, and a roof-edge prism having a refractive edge arranged on the exit surface, said roof-edge prism being formed from a transparent, curable liquid synthetic material which is deposited on said exit surface and cured in situ after said refractive edge is formed by a die in said liquid material.

4,489,409

SIGNAL PICKUP DEVICE FOR DISC REPRODUCERS

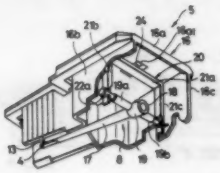
Takashi Saito, Ayase; Tatsuya Miki, and Takashi Kumaki, both of Sagamihara, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Oct. 26, 1982, Ser. No. 436,885

Claims priority, application Japan, Oct. 28, 1981, 56-160503[U]

Int. Cl.³ G11B 9/06, 21/24

U.S. Cl. 369—126 **8 Claims**



1. A signal pickup device for an apparatus for playing back an information storage medium, comprising:

(a) a body;

(b) a cartridge casing mounted in said body;

(c) a pickup cartridge housed in said cartridge casing and having a reproducing stylus for picking up signals from the information storage medium, a cantilever assembly composed of a cantilever supporting on one end thereof said reproducing stylus and a suspension member mounted on an opposite end of said cantilever, and a holder supporting said suspension member and attached to said cartridge casing for pivotable movement about said suspension member; and

(d) means in said body for enabling said reproducing stylus to impose a stylus force on the information storage medium, whereby said holder can be adjusted in angular position through the pivotable movement about said suspension member to adjust said stylus force.

4,489,410

APPARATUS FOR INSTALLING A DISK

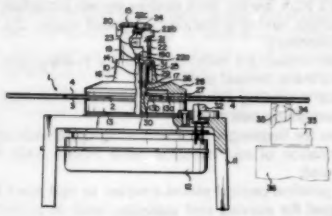
Ryoji Yamaguchi, Tokyo, and Yoshiaki Tago, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Apr. 30, 1982, Ser. No. 373,787

Claims priority, application Japan, May 1, 1981, 56-66470

Int. Cl.³ G11B 3/62, 17/00

U.S. Cl. 369—270 **6 Claims**



1. In an apparatus for installing a disk having a through hole formed in the center thereof of the type having a disk support having a supporting surface for supporting one side of the disk; a rotatable shaft having one end fixed to said disk support and

having the other end disposed above said support surface; and a disk holder for pressing the disk on its other side toward the supporting surface, thereby causing the disk to be fixed between the disk holder and the disk support, the improvement comprising said disk holder being detachably fitted to the rotatable shaft, and including:

a holder body defining a hole into which said rotatable shaft is inserted to permit movement of said holder body along the rotatable shaft;

pressure means disposed on the holder body to elastically press the disk on its other side against the supporting surface; and

slip preventive means for preventing the holder body from slipping off the rotatable shaft by engaging the holder body with the rotatable shaft, said slip preventive means including

(i) an engaging groove formed on the outer periphery of said other end of the rotatable shaft;

(ii) at least one engaging lever, one end of which is engageable with said engaging groove and the other end of which protrudes outwardly from the holder body when the disk holder receives the rotatable shaft in its hole and is pushed against the disk disposed on the disk support, said at least one engaging lever being pivotally mounted on the holder body in the middle part thereof so as to be pivotable between a first position wherein said one end thereof is engaged with the engaging groove while the other end thereof protrudes outwardly from the holder body and a second position wherein said one end thereof is disengaged from the engaging groove while the other end thereof is pressed into the holder body; and

(iii) biasing means operatively connected to said at least one engaging lever to bias said at least one engaging lever in a direction towards said first position and wherein

said holder body defines a cavity, said pressing means including a pressure assembly disposed in said cavity of the holder body to permit movement of said pressure assembly in said cavity, said pressure assembly defining a pressing surface which is pressed against the other side of the disk; and

urging means disposed between the holder body and the pressing assembly to urge the pressing surface of the pressure assembly toward the supporting surface.

4,489,411
PROCESS AND A CIRCUIT ARRANGEMENT FOR SIGNAL TRANSMISSION USING AN AMPLITUDE-MODULATED RADIO BROADCASTING SYSTEM

Ole Snedkerud, Windisch, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Continuation-in-part of Ser. No. 380,918, May 21, 1982, abandoned, which is a continuation of Ser. No. 110,823, Jan. 10, 1980, abandoned. This application Nov. 17, 1983, Ser. No. 552,021

Claims priority, application Switzerland, Feb. 8, 1979, 1225/79

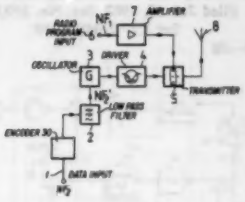
Int. Cl.³ H04J *9/00*

U.S. Cl. 370—11 **15 Claims**

1. A process for the transmission of data signals with the simultaneous transmission of a radio broadcast between an amplitude-modulated broadcast transmitter and receiver including phase and/or frequency modulation as well as amplitude modulation of a common carrier, comprising the steps, wherein:

in said transmitter:

a carrier wave with a frequency between 50 kHz and 30 MHz is generated; a sequence of binary data signals carrying an information is generated in a first signal source; said sequence is modified in such a manner that the overall time average of said sequence is zero; the bandwidth of said modified sequence is limited to frequencies equal to or less than 300 Hz; said carrier wave is at phase and/or frequency modulated by said bandwidth limited sequence, such that no distortion or only amplitude distortions of less than 3% arise during the radio transmission and the neighboring radio channels are undisturbed; said phase and/or frequency modulated carrier wave is then amplitude modulated by an audio signal from a second signal source; said modulated carrier wave is amplified and transmitted via an antenna; and



wherein in said receiver:

said transmitted carrier wave is received and demodulated at least with regard to its phase and/or frequency modulation to recover said bandwidth limited sequence; said recovered sequence is then pulse-shaped to restore the binary form of said data signals, and said information carried by said data signals is displayed.

4,489,412
SIGNAL DISTRIBUTION SYSTEM FOR A TIME-DIVISION EXCHANGE

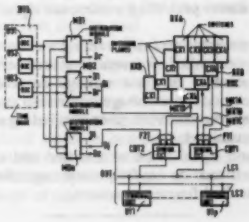
Philippe Duplessis, Colombes, and Michel Brusa, Plaisir, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Sep. 20, 1982, Ser. No. 420,208

Claims priority, application France, Sep. 18, 1981, 81 17643

Int. Cl.³ H04J *3/00*

U.S. Cl. 370—16 **7 Claims**



1. A signal distribution system for a time-division exchange comprising:

a central switching network organised as a plurality of independent planes;

a plurality of terminal units, each connected to each plane of the switching network by at least one first multiplex link,

exchange control means of distributed architecture comprising a plurality of control units, each likewise connected to each plane of the switching network by at least one second multiplex link; and

a time base supplying signals to clock signal distribution modules for distributing clock signals to said units by means of clock signal and synchronisation signal distribution links; and

wherein the exchange includes at least two independent parallel connections connecting each terminal unit via said first multiplex links to different planes of the switching

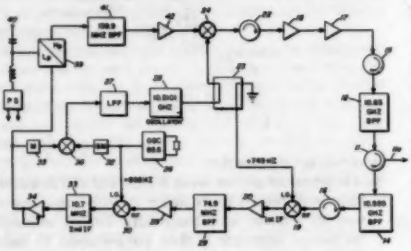
network and via said clock signal distribution links and synchronisation signal distribution links to different distribution modules which are likewise provided with different power supplies.

4,489,413

APPARATUS FOR CONTROLLING THE RECEIVE AND TRANSMIT FREQUENCY OF A TRANSCEIVER

Robert L. Richmond, Fairfax, Va.; John E. Corrigan, Washington, D.C., and Paul F. Wyar, Arlington, Va., assignors to M/A-COM DCC, Inc., Germantown, Md.

Filed Jul. 19, 1982, Ser. No. 399,573
Int. Cl.³ H04B *1/50*
U.S. Cl. 370—30 **16 Claims**



1. An apparatus for controlling the receive and transmit frequency of a transceiver comprising:

means for receiving a radio frequency carrier signal having information for demodulating at a first radio frequency;

first frequency conversion means comprising a first mixer having a first input connected to receive said radio frequency carrier signal;

a voltage controlled frequency source having an output signal connected to a second input of said mixer whereby said mixer provides a first intermediate frequency signal;

a second frequency conversion means having a second mixer connected to receive said first intermediate frequency signal containing information for demodulating and producing a second mixer output signal;

a local oscillator providing a reference signal to said second mixer;

frequency detector means providing a control signal to said voltage controlled frequency source estabilishing frequency control for said voltage controlled frequency source to produce a voltage controlled signal;

means for mixing said voltage controlled signal with a signal to be transmitted;

whereby said signal to be transmitted and said signal containing information are frequency controlled by said voltage controlled frequency source.

4,489,414

COMPUTER PERIPHERAL TESTING EQUIPMENT

Robert H. Titherley, Weybridge, England, assignor to Hal Computers Limited, Surrey, England

Filed Oct. 28, 1981, Ser. No. 316,047
Int. Cl.³ G06F *11/22*
U.S. Cl. 371—20 **7 Claims**

1. Testing equipment for testing computer peripherals, comprising, in combination, a portable case having operator panel means and containing a microprocessor system, a plug-in firmware module for releasable plug-in connection with the system and containing firmware constituting peripheral test and exercising programming routines, and a plug-in input/output module providing an interface circuit including line drivers for releasably coupling a computer peripheral to said system, the system comprising:

a first connector available to the operator at said panel means for receiving said input/output module and said first connector having a plurality of contacts for electrically contacting said input/output module;

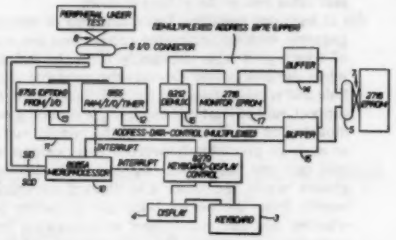
a keyboard on said operator panel means;

a monitor in said case storing monitor routines;

a second connector available to the operator at said panel means for releasably receiving and electrically connecting to said plug-in firmware module;

a microprocessor in said case; and

an address, data and control bus also in said case and coupling said microprocessor to said first connector, to said monitor, to said keyboard and to said second connector to enable said microprocessor to read and execute the test and exercising routines from said firmware module under control of said keyboard and microprocessor, and to enable said microprocessor to create output signals for, and



read input signals from, the peripheral via said second connector in consequence of the execution of said routines;

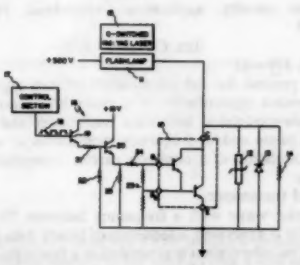
said firmware module comprising instructions for assigning functions to a portion of the keyboard for use in the execution of the firmware testing and exercising routines under control of said portion of the keyboard, and said firmware module also providing instructions for configuring contacts of the first connector such that some of said contacts provide for input from and others for output to said bus, the functions of said portion of the keyboard, the configuration of the first connector and the form of testing and exercising being dependent upon said firmware module which can be interchanged, as can said input/output module, to adapt the equipment to a range of computer peripherals.

4,489,415

PULSE PUMPING AN OPTICALLY PUMPED LASER

William B. Jones, Jr., Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 12, 1982, Ser. No. 397,374
Int. Cl.³ H01S *3/092*
U.S. Cl. 372—38 **5 Claims**



1. In an optically pumped laser having a gaseous discharge

flashlamp for pumping the laser and a pulsing circuit that generates flashlamp current pulses, the improvement wherein said pulsing circuit comprises:

a high current switching transistor in series with said flashlamp and connected to a source of dc voltage;

a control circuit for generating base drive pulses which render said switching transistor conductive to pulse said flashlamp;

wherein said switching transistor is a Darlington pair and said control circuit injects currents into the base of both transistors; and

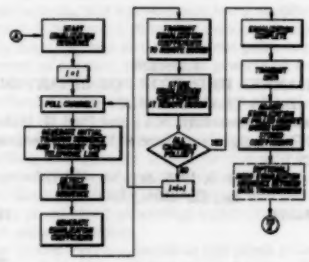
means in parallel with said switching transistor to provide a path for flashlamp simmer current during nonconducting intervals of said switching transistor.

4,489,416

EQUALIZATION SYSTEM FOR MODEMS IN A POLLED ARRANGEMENT

Richard L. Stuart, Columbia, Md., assignor to Rixon, Inc., Silver Spring, Md.

Filed Mar. 18, 1983, Ser. No. 476,682
Int. Cl.³ H04B 3/04
U.S. Cl. 375—13 5 Claims



1. In a data transmission system of the type including a central data transmitter-receiver linked to a plurality of remote data transmitter-receivers via separate data transmission channels, each channel having varying electrical characteristics, the central data transmitter-receiver including means for polling each of the data transmission channels, the system further comprising:

an automatic equalizer at the central data transmitter-receiver;

and automatic equalizer at each of the remote data transmitter-receivers;

means at the central data transmitter-receiver for generating an initial training sequence of data signals, for transmitting the training sequence, in turn, over each data transmission channel, for detecting the electrical characteristics of each data transmission channel, generating equalization coefficients suitable for adjusting the characteristics of the data transmission channel in a preferred manner, and for transmitting as data the equalization coefficients associated with each data transmission channel to its associated remote data transmitter-receiver; and

means at each remote data transmitter-receiver for storing the transmitted equalization coefficients associated with its data transmission channel,

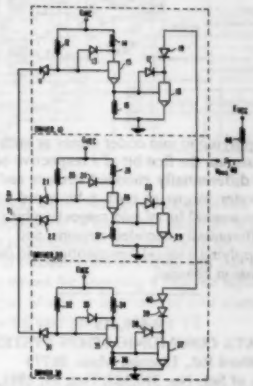
whereby each data transmission channel is automatically equalized by the qualizer associated with its respective remote date transmitter-receiver whenever the particular data transmission channel is polled by the central data transmitter-receiver.

4,489,417

MULTI-LEVEL COMMUNICATION CIRCUITRY FOR COMMUNICATING DIGITAL SIGNALS BETWEEN INTEGRATED CIRCUITS

Haluk O. Askin, Clinton Corners; Bryant K. Ho, Hopewell Junction, and Guy Rabbat, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 24, 1982, Ser. No. 444,102
Int. Cl.³ H04L 25/49
U.S. Cl. 375—17 10 Claims



1. A communication circuit for communicating a multi-bit digital signal between transmitting and receiving locations over a single conductor, comprising:

transmitting means at said transmitting location for producing a multi-level signal upon said conductor having a level determined in accordance with a state of an input multi-bit digital signal, said transmitting means comprising a plurality of first transistors and first diodes coupled such that the levels of said multi-level signal are determined by collector to emitter voltages of said first transistors and forward drops of said first diodes; and

receiving means at said receiving location for producing an output multi-bit digital signal in response to said multi-level signal and corresponding to said input multi-bit digital signal, said receiving means comprising a plurality of second transistors and second diodes coupled to detect said multi-level signal in accordance with a plurality of threshold levels, said threshold levels being determined by threshold voltage levels of said second transistors and forward drops of said second diodes.

4,489,418

DIFFERENTIAL ENCODING TECHNIQUE

James E. Mazo, Fair Haven, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 18, 1983, Ser. No. 486,080
Int. Cl.³ H04L 25/16
U.S. Cl. 375—27 10 Claims

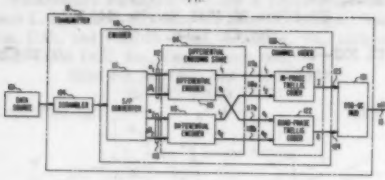
1. Apparatus comprising

coder means for generating in response to first and second streams of n-bit words applied to said coder means a stream of in-phase and quadrature-phase coder outputs, an individual one of said in-phase and quadrature-phase coder outputs being generated for each n-bit word in an associated one of said first and second streams, each in-phase and quadrature-phase coder output being a function of the values of predetermined ones of the bits exclusively in the associated one of said streams, and the coder output generated when each of said predetermined ones of said

bits has a particular value being the negative of the coder output generated when each of said predetermined ones of said bits has its other value,

means for receiving n streams of bit pairs,

means for differentially encoding successive pairs of bits in each of said received streams to form n streams of differentially encoded bit pairs,



means for applying to said coder means as each n-bit word of said first stream the first bit of a respective bit pair in each of said n differentially encoded streams and for applying to said coder means as each n-bit word of said second stream the second bit of said respective bit pair in each of said n differentially encoded streams, and

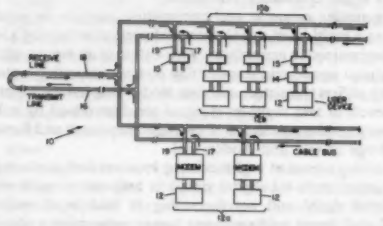
means for applying a signal representing said data symbols to a transmission channel.

4,489,419

DATA COMMUNICATION SYSTEM

An Wang, Bedford Rd., Lincoln, Mass. 01773

Continuation of Ser. No. 316,303, Oct. 29, 1981, abandoned.
This application Jun. 6, 1984, Ser. No. 617,829
Int. Cl.³ H04B *3/00*; H01R *7/30, 13/64*
U.S. Cl. 375—36 2 Claims



2. A data communication system for the transmission of electrical information signals among a plurality of user devices removably connected to said system,

said data communication system having a signal transmission medium comprising signal receive and signal transmit branches of coaxial cable,

a plurality of interface means each for connection to a user device and each providing a signal transmit portion and a signal receive portion,

each interface means further providing a coaxial cable transmit threaded plug connector connected to said signal transmit portion, and a coaxial cable receive threaded plug connector connected to said signal receive portion,

said data communication system further providing a plurality of outlets, each outlet being connected to said receive and transmit coaxial cable branches through receive and transmit drop lines respectively, each outlet providing a coaxial cable transmit threaded receptacle connected to said transmit drop line and a coaxial cable receive threaded receptacle connected to said receive drop line,

a said transmit threaded plug connector and a said transmit threaded receptacle together comprising a transmit cable connector, and a said receive threaded plug connector and a said receive threaded receptacle together comprising a receive cable connector,

the mating threaded portions of every said transmit cable connector being threaded in a first sense, and the mating threaded portions of every said receive cable connector being threaded in a second sense, any said interface means being removably connectable to any said outlet only in a correct transmit-receive relationship,

said outlet comprising:

a box structure having

first and second flanges, and

a raised portion having a ramped surface of height increasing from said first flange toward said second flange, and a terminal face generally at a right angle to said ramped surface, said receptacles being mounted on said terminal face,

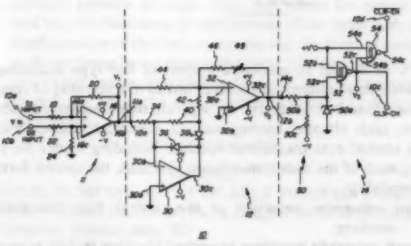
said flanges having screw holes and adapted to be mounted to a wall by means of screws passing through said screw holes with said first flange placed higher than said second flange, whereby said receptacles are directed downwardly and slightly outwardly of the wall.

4,489,420

CLEAR CHANNEL DETECTOR FOR BINARY DIGITAL DATA TRANSMISSION SYSTEM

Lewin T. Baker, Schenectady, N.Y., and Paul G. Huber, West Warwick, R.I., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 9, 1983, Ser. No. 473,826
Int. Cl.³ H04Q *9/00*
U.S. Cl. 375—94 11 Claims



1. A detector, for use with binary 1 and binary 0 symbol detector outputs of a receiver in at least one of a plurality of stations in a system for binary data transmission over a common transmission medium channel, comprising:

first means, receiving the binary 1 and binary 0 symbol outputs, for providing an output signal having a polarity changing with a change in binary symbol signal received and also for providing said output signal substantially at a predetermined magnitude only if neither one, or both simultaneously, of the binary symbol outputs are received;

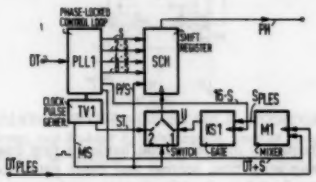
second means for providing the absolute value of said first means output signal to provide a unipolar output signal having a magnitude responsive to said absolute value of said first means output signal; and

third means for providing at least a first detector output signal, indicative of said channel then being in use, only if said unipolar second means output signal magnitude exceeds a threshold value.

4,489,421
DIGITAL MESSAGE TRANSMISSION SYSTEM EMPLOYING PULSE STUFFING AND HAVING TWO PLESIOCHRONIC SAMPLING CLOCKS

Erich Burger, Germering, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 12, 1983, Ser. No. 457,354
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1982, 3201965
Int. Cl.³ H04L *7/06*
U.S. Cl. 375—112 **11 Claims**



1. In a digital message transmission system for transmitting messages in the form of sum pulse sequences comprised of two component pulse sequences from a transmit side to a receive side of said system, said transmit side being supplied with first and second plesiochronic reference data clock signals for respectively sampling said two component pulse sequences, the improvement of a binary phase word generating means at said transmit side for deriving a binary word corresponding to the phase difference between said plesiochronic reference data clock signals for subsequent insertion in said component pulse sequences before transmission of said sum pulse sequence by pulse stuffing, and a means at said receive side for regaining said component pulse sequences and said plesiochronic reference data clock signals from a transmitted sum pulse sequence, said binary phase word generating means comprising:

a clock pulse generator;

a phase locked loop connected to said clock pulse generator and supplied with said first plesiochronic reference data clock signal and having a divider means for generating a first auxiliary clock signal;

a mixer having a first input to which a sum signal comprised of said first plesiochronic reference data clock signal and said auxiliary clock signal is supplied and a second input to which said second plesiochronic reference data clock signal is supplied, said mixer generating a second auxiliary clock signal plesiochronic with respect to said first auxiliary clock signal; and

a means for comparing the phases of said first and second auxiliary clock signals, the result of the comparison being utilized for forming said binary phase word.

4,489,422
FREEZE CLOCK CIRCUIT

Joseph P. Paradise, Somerville, and Donald J. Derkach, Flemington, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 21, 1981, Ser. No. 332,831
Int. Cl.³ G06M *3/12*
U.S. Cl. 377—28 **8 Claims**

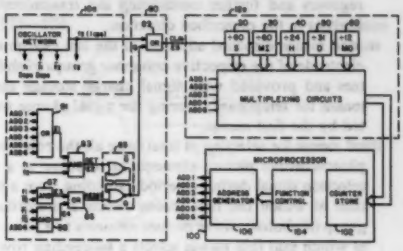
1. A timing system comprising:

a plurality of counters, each counter having a toggle input to which is applied a counting pulse and having an output;

read-out means coupled to said counters responsive to a read-out command for selectively reading-out their contents;

a source of regularly occurring input pulses; and

control means coupling said source of regularly occuring input pulses to the toggle input of at least one of said plurality of counters for normally applying said input pulses with little, if any, delay to the input of said at least one of said plurality of counters, said control means including means for generating a timing signal for a period of time T1 prior to each occurrence of said regularly occurring input pulses, said control means being responsive to said timing signal and to the occurrence of a read-

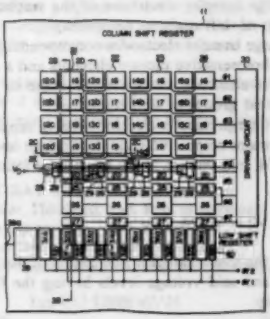


out command within said given time period, T1, for delaying the application of said input pulse for a period of time T2 which is sufficiently long to enable the read-out of said plurality of counters one at a time, and said control means including means for applying a delayed input signal to the toggle input of said at least one of said plurality of counters following said period of time T2.

4,489,423
CHARGE TRANSFER TYPE AREA IMAGE SENSOR WITH IMPROVED RESOLUTION AND BLOOMING SUPPRESSION

Nobuo Suzuki, Kamakura, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 14, 1981, Ser. No. 283,192
Claims priority, application Japan, Nov. 4, 1980, 55-154826
Int. Cl.³ G11C *19/28;* **H01L** *29/78, 27/14, 31/00*
U.S. Cl. 377—58 **2 Claims**



1. A charge transfer type area image sensor which comprises:

a photosensitive section which is constructed by arranging a plurality of photosensitive picture elements for storing a signal charge generated in accordance with the intensity of an incoming light on a semiconductor substrate of a first conductivity type in the direction of the column and the direction of the row to make a two-dimensional form;

a plurality of columnar shift registers which include charge transfer channels disposed in parallel with the columnar groups of the photosensitive picture elements of the photosensitive section and a plurality of charge transfer electrodes mounted on the charge transfer channels with an

insulation layer interposed therebetween, thereby transmitting a charge in a prescribed direction;

first means for sequentially selecting the row groups of photosensitive picture elements of the photosensitive section in response to a first selection signal, transmitting the signal charges stored in the selected row group of picture elements to the corresponding columnar shift registers and further conducting the transmitted signal charges in the prescribed direction;

second means disposed adjacent to the last charge transfer electrode of the respective columnar groups of shift registers and provided with signal charge storage electrode means for temporarily storing the signal charge transmitted by the first means;

third means for selecting at least once all the row groups of photosensitive picture elements in response to a second selection signal during a period extending from a point of time at which the first means selects a prescribed row group of photosensitive picture elements to a point of time at which said first means selects a succeeding row group of photosensitive picture elements, transmitting excess charges, defined as a charge amount by which the charges capable of being stored in the respective picture elements are exceeded, to the corresponding columnar groups of shift registers, and conducting the transmitted excess charges in the prescribed direction;

fourth means which comprises a control electrode positioned adjacent to the last charge transfer electrode of the respective columnar groups of shift registers and a drain region disposed adjacent to said control electrode, and discharges the excess charge transmitted by the third means to the drain region by controlling the level of a voltage impressed on said control electrode; and

a row-directed shift register for converting the signal charges of the respective row groups of photosensitive picture elements temporarily stored by the second means into series signal charges and sending forth the series signal charge in the order of the row groups of photosensitive picture elements;

the charge transfer electrodes of the respective columnar groups of shift registers comprising:

first charge transfer electrodes corresponding to the respective photosensitive picture elements and a second charge transfer electrode set in the last stage of the respective columnar groups of shift registers;

the first charge transfer electrodes being supplied with drive pulse trains respectively having voltage levels of V1, V2, V3, V4, said voltage levels having the following relationship:

$$V1<V2<V3<V4$$

when the semiconductor substrate is of the p conductivity type, and said voltage levels having the following relationship:

$$V1>V2>V3>V4$$

when the semiconductor substrate is of the n conductivity type;

said first means including means for impressing the first charge transfer electrode with a pulse having the voltage level of V4 as the first selection signal;

said third means including means for impressing the first charge transfer electrode with a pulse having the voltage level of V3 as the second selection signal; and

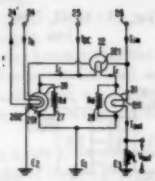
said means for transmitting a charge in the prescribed direction along the charge transfer channel including means for impressing the first charge transfer electrode with a pulse having the voltage level of V2 as a charge transfer signal.

4,489,424

FREQUENCY DIVIDER MAKING USE OF JOSEPHSON JUNCTION CIRCUITS

Junichi Sone, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed May 11, 1982, Ser. No. 376,994
Claims priority, application Japan, May 14, 1981, 56-72506
Int. Cl.³ H03K 21/00, 23/24
U.S. Cl. 377—93 9 Claims



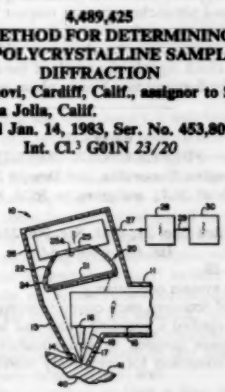
1. A frequency divider circuit having a first frequency divider comprising first, second and thrid gate circuits each including a Josephson junction having a gate current path and a control current path, each said Josephson junction, in response to a control current flowing in its control current path, assuming a voltage state in which it presents an impedance to current flowing in its gate current path, and in response to the absence of said control current flowing in said control current path, assuming a zero voltage state in which it presents substantially no impedance to current flowing in its gate current path, the gate current paths of said first and second gate circuits being connected in parallel to each other between first and second parallel connection junctions, the control current path of said third gate circuit being connected between one of said parallel connection junctions and the gate current path of said first gate circuit, a first terminal adapted to be fed with a D.C. current having a sufficient magnitude for bringing said third gate circuit into the voltage state being connected to said one of said parallel connection junctions, a first resistor having a predetermined resistance and connected in series with the control current path of said first gate circuit to form a first series connection, said gate current path of said third gate circuit and control current path of said second gate circuit being connected in series to form a second series connection, and an input terminal receiving an input pulse signal to be frequency divided connected in common to said first and second series connections.

4,489,425

MEANS AND METHOD FOR DETERMINING RESIDUAL STRESS ON A POLYCRYSTALLINE SAMPLE BY X-RAY DIFFRACTION

Giancarlo Borgonovi, Cardiff, Calif., assignor to Science Applications, Inc., La Jolla, Calif.

Filed Jan. 14, 1983, Ser. No. 453,809
Int. Cl.³ G01N 23/20
U.S. Cl. 378—72 11 Claims



1. A method for quantitatively determining residual stress on

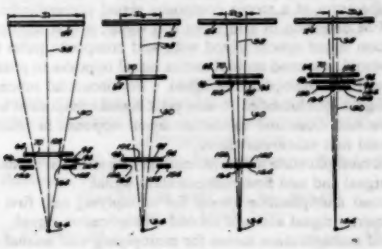
a sample of polycrystalline material, comprising the steps of irradiating a surface portion of said sample with a collimated beam of substantially monochromatic X-ray radiation to form a cone of diffracted radiation which extends and expands outwardly from said surface portion, forming a two-dimensional image of at least a substantial portion of the cross-sectional periphery of said cone, said image defining the intersection between said cone and a substantially planar X-ray responsive detector, and generating a first geometric curve based upon an assumed value of said stress for comparison with said image.

4,489,426

COLLIMATOR WITH ADJUSTABLE APERTURE

Joseph J. Grass, and Robert J. Dobberstein, both of Brookfield, Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 23, 1981, Ser. No. 334,032
Int. Cl.³ G03B 41/16
U.S. Cl. 378—150 9 Claims



1. A collimator for being positioned between a source of x-radiation and a detector to regulate the size of the pattern of radiation projected onto said detector, comprising:

a first collimating plate located on a longitudinal axis between said radiation source and said detector, said plate being made of radiopaque material and having a first circular aperture to pass a portion of radiation from said source for said aperture to define a radiation pattern presented to said detector;

first drive means for advancing said first plate along said axis from a first extremity of travel nearest said radiation source to a second extremity of travel further from said radiation source for said aperture to reduce the angle of divergence and the diameter of said beam projected on said detector;

a second collimating plate made of radiopaque material and having a second circular aperture smaller than said first aperture;

means for selectively placing said second collimating plate in an active position between said radiation source and said first collimating plate such that said second aperture defines the size of said radiation pattern;

means for selectively removing said second collimating plate from said active position to an inactive position such that it no longer defines the size of said radiation pattern; and

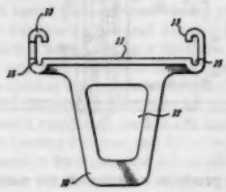
second drive means for advancing said second plate along said longitudinal axis from a first extremity of travel nearest said radiation source to a second extremity of travel further from said radiation source when said second plate is in said active position to further reduce the size of said pattern.

4,489,427

BITEWING HOLDER

Kenneth L. Allison, Claremont; Helio Gomez, So. Pasadena, and Robert Manchego, Azusa, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 465,990, Feb. 14, 1983, abandoned.
This application Dec. 15, 1983, Ser. No. 561,151
Int. Cl.³ G03B 41/16
U.S. Cl. 378—170 1 Claim



1. A plastic holder for a rigid bitewing x-ray photoreceptor cassette, the cassette enclosed in a plastic bag, comprising

a single unit of plastic formed into a relatively thick rigid backing plate, a relatively thin flexible tab and two gripping members,

said tab being attached along the length of one side of said backing plate with the center line of said backing plate lying in the plane of said tab, said tab having its central portion removed to allow a closer masking of the teeth and to minimize x-ray interference,

a gripping member attached to each end of said backing plate and positioned to grip one edge of the cassette to hold the cassette against the backing plate in a position perpendicular to the plane of said tab and with the length of the backing plate in parallel with the plane of the cassette,

said gripping members being slightly flexible and having surfaces oppposite said backing plate sloping toward said backing plate so that a cassette edge pressed against said sloping surfaces will snap into contact with said backing plate in a position perpendicular to the plane of said tab and with the length of the backing plate in parallel with the plane of the cassette without tearing said plastic bag, and

wherein said backing plate has sections of reduced thickness at the points of attachment of said gripping members to allow said gripping members to be flexible at those points.

4,489,428

X-RAY SPOT-FILM DEVICE

Horst H. Schwieker, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 4, 1982, Ser. No. 385,241
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1981, 3122723
Int. Cl.³ G03B 41/16
U.S. Cl. 378—176 15 Claims

1. An X-ray spot-film device comprising:

a cassette carriage;

a first sliding fixture on the cassette carriage, said first sliding fixture having a variable opening whose size is determined by the height of a cassette placed in the fixture;

a second sliding fixture on the cassette carriage, said second sliding fixture having a variable opening whose size is determined by the width of a cassette placed in the fixture;

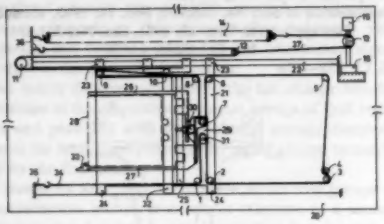
a strap coupled to the first and second sliding fixtures, said strap having a measurable dimension whose value represents the height and width of a cassette in the first and second sliding fixtures; and

a detector device for measuring the value of the measurable dimension of the strap;

characterized in that:

the strap is a single strap; and

the strap is coupled to the first and second sliding fixtures such that a unit change in the size of the opening of the



first fixture produces a change in the measurable dimension of the strap which is not equal to the change in the measurable dimension of the strap produced by a unit change in the size of the opening of the second fixture.

4,489,429

PROGRAMMABLE CALCULATOR WITH VERBAL INDICATIONS OF STORED PROGRAMS

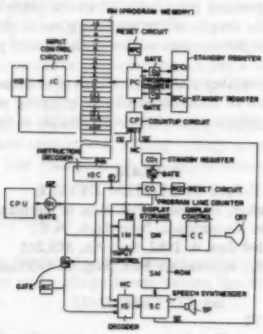
Shintaro Hashimoto, Ikoma, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 28, 1980, Ser. No. 154,026

Claims priority, application Japan, May 31, 1979, 54-74426[U]

Int. Cl.³ G10L *1/00*; G06F *3/16*

U.S. Cl. 381—51 **3 Claims**



1. A programmable calculator comprising:

keyboard means for inputting a program having a plurality of lines of data into said calculator in a line-by-line format;

memory means in said calculator for storing said program input by said keyboard in said line-by-line format;

display means for simultaneously providing a visual display of a selected plurality of lines of said program in said line-by-line format input by said keyboard and stored in said memory; and

sound output means for sequentially providing verbal indications of individual ones of said selected plurality of lines being visually displayed by said display means.

4,489,430

FM STEREO DEMODULATION CIRCUIT

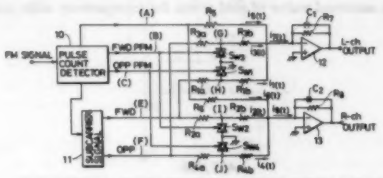
Kohji Ishida; Tatsuo Numata, and Tadashi Noguchi, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 17, 1982, Ser. No. 408,993

Claims priority, application Japan, Aug. 18, 1981, 56-129855

Int. Cl.³ H04H *5/00*

U.S. Cl. 381—7 **5 Claims**



1. An FM stereo demodulation circuit for demodulating into first and second channel signals the audio information contained in an input FM signal having a pilot signal component, said demodulation circuit comprising:

signal generating means for generating from said input FM signal a composite pulse train signal having the frequency spectrum of a stereo composite signal corresponding to FM detection of said input FM signal, a first multiplication signal synchronized with said composite pulse train signal, a second multiplication signal opposite in phase to said first multiplication signal, a firs sinusoidal subcarrier signal synchronized to said pilot signal component and a second sinusoidal subcarrier signal opposite in phase to said first subcarrier signal;

first multiplication means for multiplying said first subcarrier signal and said first multiplication signal;

second multiplication means for multiplying said first subcarrier signal and said second multiplication signal;

third multiplication means for multiplying said second subcarrier signal and said first multiplication signal;

fourth multiplication means for multiplying said second subcarrier signal and said second multiplication signal;

first combining means for combining said composite pulse train signal and outputs of said second and third multiplication means to obtain said first channel signal; and

second combining means for combining said composite pulse train signal and outputs of said first and fourth multiplication means to obtain said second channel signal, wherein each of said first through fourth multiplication means comprises a series connection of at least first and second resistors having an input end for receiving a respective one of said first and second subcarrier signals and having an output end for providing a respective multiplication means output, and switch means connected between a reference potential and a point in said series connection between said first and second resistors and selectively coupling said point to said reference potential in response to a switching signal, each of said switch means in said first through fourth multiplication means receiving as its switching signal the respective one of said first or second multiplication signals provided thereto for multiplication.

4,489,431

SIGNAL INTERFERENCE PROTECTION CIRCUIT FOR AM STEREO RECEIVER

Lawrence M. Ecklund, Wheaton, Ill., assignor to Motorola, Inc.

Filed Jun. 8, 1982, Ser. No. 386,374

Int. Cl.³ H04H *5/00*

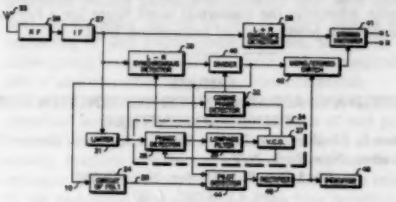
U.S. Cl. 381—15 **5 Claims**

1. A protection circuit for an AM stereo receiver having input means for receiving a signal which may contain a prede-

termined infrasonic tone and which may also contain interfering signals; the protection circuit comprising:

filter means coupled to the input means and having a pass band for passing only the range of possible frequencies of said interfering signals;

level sensing means coupled to the filter means output for providing an output signal in response to filtered signals having at least a predetermined amplitude;



detector means coupled to the input means for detecting the presence of said predetermined infrasonic tone and controlling at least one portion of said receiver in response thereto;

first control means coupled to the detector means input for resetting the detector means; and

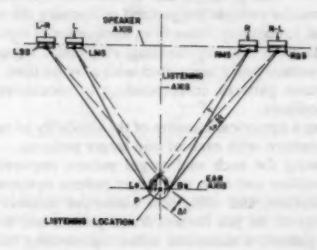
timing control means coupled to the level sensing means output and to the detector means input for cooperating in the control of the at least one receiver portion.

4,489,432

METHOD AND APPARATUS FOR REPRODUCING SOUND HAVING A REALISTIC AMBIENT FIELD AND ACOUSTIC IMAGE

Matthew S. Polk, Baltimore, Md., assignor to Polk Audio, Inc., Baltimore, Md.

Filed May 28, 1982, Ser. No. 383,151
Int. Cl.³ H04R 5/00
U.S. Cl. 381—24 **14 Claims**



1. In a stereophonic sound reproduction system having a left channel output and a right channel output, apparatus for reproducing sound having a realistic ambient field and acoustic image comprising:

a right main speaker and a left main speaker disposed respectively at right and left main speaker locations equidistantly spaced from a listening location, the listening location being a place in space for accommodating a listener's head facing the main speakers and having a right ear location and a left ear location along an ear axis, with the right and left ear locations separated along the ear axis by a maximum interaural sound distance of Δt_{max}, and the listening location being defined as the point on the ear axis equidistant to the right and left ears;

a right sub-speaker and a left sub-speaker disposed respectively at right and left sub-speaker locations equidistantly spaced from the listening location;

the right main speaker being separated from the right ear location by a sound distance t and being separated from the left ear by a sound distance $t+\Delta t$ where Δt is the interaural sound distance of the right and left ear locations with respect to the right main speaker;

the right sub-speaker being separated from the right ear location by a sound distance $t+\Delta t'$ where $\Delta t'$ is the sound distance spacing with respect to the right ear location between the right main speaker location and right sub-speaker location;

the left main speaker being separated from the left ear location by a sound distance t and being separated from the right ear location by a sound distance $t+\Delta t$ where Δt is the interaural sound distance between the left and right ear locations with respect to the left main speaker;

the left sub-speaker being separated from the left ear location by a sound distance $t+\Delta t'$ where $\Delta t'$ is the sound distance spacing with respect to the left ear location between the left main speaker location and left sub-speaker location;

the main speaker locations and sub-speaker locations being spaced from the listening location in a manner such that $\Delta t+\Delta t' \leq \Delta t_{max}$;

means coupling the right and left channel outputs, respectively, to said right and left main speakers;

means connected to the right and left channel outputs for developing a left channel minus right channel signal and a right channel minus left channel signal;

means coupling said left channel minus right channel signal to said left sub-speaker and said right channel minus left channel signal to said right sub-speaker;

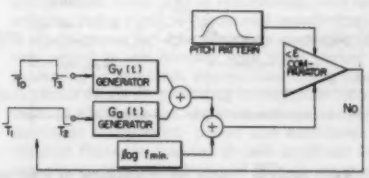
whereby sound reproduced by said apparatus as perceived by a listener whose head is located generally at the listening location has a realistic acoustic field and enhanced acoustic image.

4,489,433

SPEECH INFORMATION TRANSMISSION METHOD AND SYSTEM

Akio Suchiro, Yokohama, and Akira Ichikawa, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 363,146, Mar. 29, 1982, , which is a continuation of Ser. No. 100,096, Dec. 4, 1979, abandoned. This application Mar. 8, 1984, Ser. No. 587,526
Claims priority, application Japan, Dec. 11, 1978, 53-152064
Int. Cl.³ G10L 1/00
U.S. Cl. 381—41 **4 Claims**



1. An apparatus for transmitting and receiving speech information through a Telex system, comprising:

(a) speech input conversion means for converting an analog speech signal to be transmitted into a corresponding digital speech signal;

(b) speech characteristic extracting and compressing means including:

(b-1) a speech characteristic extractor circuit for extracting speech characteristic parameters and pitch frequencies from said digital speech signal; and

(b-2) a syllable unit/phonetic symbol and accent type determining circuit responsive to the extracted speech characteristic parameters for extracting at least one of syllable units and phonetic symbols from said digital speech signal and compressing the extracted syllable units or phonetic

symbols to prepare a character code train of a low bit rate, and for determining word accent types of words or phrases contained in said character code train from said pitch frequencies to produce a word accent type identifying code, the word accent type being defined to identify a word or phrase in a series of syllables and corresponding to a position among the syllables at which the pitch frequency changes abruptly;

(c) Telex coding means for converting the character code train of the low bit rate and said word accent identifying code into a Telex code signal by allotting the character code train to allocated Telex code positions from a Telex coding table for said characters and by allotting the word accent identifying code to unallocated Telex code positions from said Telex coding table;

(d) channel means for transmitting the Telex code signal;

(e) code conversion means for converting said transmitted Telex code signal into a corresponding signal train of the syllable units or phonetic symbols and a word accent type identifiying signal; and

(f) speech information reproducing means including:

(f-1) a decoding circuit for decoding said signal train and said word accent type identifying signal from the output of said code conversion means into speech characteristic parameters and pitch frequencies, respectively, said pitch frequencies being determined in accordance with reference pitch patterns for individual syllables or with a predetermined pitch pattern simulation function, and

(f-2) a speech synthesizing circuit for synthesizing voice speech on the basis of the speech characteristic parameters and the pitch frequencies from the output of said decoding circuit, to thereby reproduce the information of the speech signal.

4,489,434

SPEECH RECOGNITION METHOD AND APPARATUS

Stephen L. Moshier, Cambridge, Mass., assignor to Exxon Corporation, New York, N.Y.

Filed Oct. 5, 1981, Ser. No. 308,891
Int. Cl.³ G10L *1/00*
U.S. Cl. 381—43 **16 Claims**
MICROFICHE APPENDIX INCLUDED
(16 Microfiche, 742 Pages)

1. In a speech analysis system for recognizing at least one predetermined keyword in an audio signal, each keyword being characterized by a template having at least one target pattern, and each target pattern representing at least one short-term power spectrum, and each target pattern having a minimum dwell time duration and a maximum dwell time duration, the method comprising the steps of:

forming at a repetitive frame rate, a sequence of frame patterns from and representing said audio signal, each frame pattern being associated with a frame time, said frame rate corresponding to a frame interval less than one-half the minimum dwell time duration,

generating, for each frame pattern, a numerical measure of the similarity of said each frame pattern with ones of said target patterns,

accumulating, for each frame time and each keyword, and using said numerical measures and said minimum and maximum dwell times, a numerical word score representing the likelihood that a said keyword ended at a said frame time,

said accumulating step including the step of accumulating, for each keyword, the numerical measures for each of a continuous sequence of said repetitively formed frame patterns, starting with the numerical measure of the similarity of a present frame pattern and a last target pattern of said keyword, and

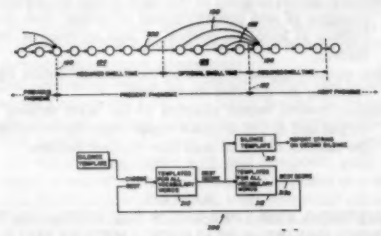
generating at least a preliminary keyword recognition decision whenever the numerical word score for a keyword exceeds a predetermined recognition level.

4,489,435

METHOD AND APPARATUS FOR CONTINUOUS WORD STRING RECOGNITION

Stephen L. Moshier, Cambridge, Mass., assignor to Exxon Corporation, New York, N.Y.

Filed Oct. 5, 1981, Ser. No. 309,208
Int. Cl.³ G10L *1/00*
U.S. Cl. 381—43 **16 Claims**



1. In a speech analysis apparatus for recognizing at least one keyword in an audio signal, each keyword being characterized by a template having at least one target pattern, each target pattern representing at least two short-term power spectra, and each target pattern having associated therewith at least two required dwell time positions and at least one optional dwell time position, the recognition method comprising the steps of:

forming at a repetitive frame time, a sequence of input frame patterns from and representing said audio signal, each frame pattern being associated with a frame time, successive frame patterns corresponding to successive dwell time positions,

generating a numerical measure of the similarity of each said frame pattern with each of said target patterns,

accumulating for each said target pattern required dwell time position and each said target pattern optional dwell time position, and using said numerical measure of the similarity of the just formed frame pattern and said each target pattern, a numerical value representing the alignment of the just formed frame pattern with the respective target pattern dwell time position, and

generating a recognition decision, based upon said numerical values, when a predetermined sequence occurs in said audio signal.

4,489,436

DEVICE FOR VOCALLY INDICATING CAUSES OF ABNORMAL CONDITIONS OF A SEWING MACHINE

Motokazo Yoshimura; Michitaka Takiguchi; Fujio Horie, and Koichi Hirata, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jan. 4, 1982, Ser. No. 336,945
Claims priority, application Japan, Jan. 23, 1981, 56-9157; May 19, 1981, 56-75418
Int. Cl.³ G10L *1/00*
U.S. Cl. 381—51 **3 Claims**

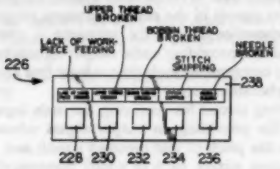
1. In a sewing machine, the improvement comprising a

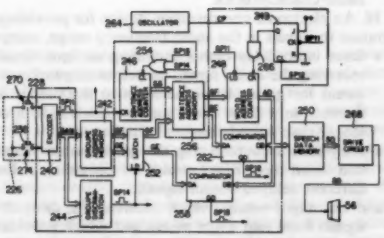
device for vocally indicating plural possible causes of each of plural different abnormal conditions which may take place in said sewing machine and which can be perceived by the operator, comprising:

(a) memory means for permanently storing plural groups of speech data, each speech data group consisting of plural sub-groups which correspond to plural oral statements indicating said plural possible causes of said each of the abnormal sewing machine conditions, said each speech data group being related to one of cause groups each consisting of said plural possible causes, said each one cause group being supposed to cause each corresponding one of said abnormal sewing machine conditions;

(b) plural operator-controlled buttons corresponding to said abnormal sewing machine conditions, each of said plural buttons being operable to designate one of said abnormal sewing machine conditions which is perceived by the operator, and to thereby pick up the cause group related to the designated abnormal sewing machine condition;

(c) control means responsive to the operation of each of said





plural buttons for controlling said memory means to output each of said plural groups of speech data;

(d) means for emitting said oral statements indicating the plural possible causes of said designated abnormal sewing machine condition, based on the group of speech data output from said memory means,

said each of the plural buttons being operable repeatedly to pick up one after another said plural possible causes of the cause group which is related to said abnormal sewing machine condition designated by said each of the plural buttons,

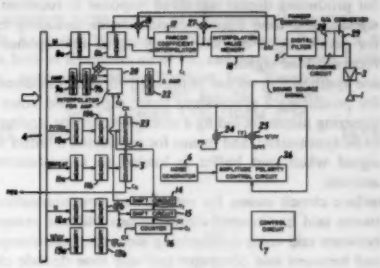
said control means including means for sequentially designating said sub-groups of the speech data group related to said designated abnormal sewing machine condition in response to the repeated operations of said each of the plural buttons, thereby controlling said memory means to sequentially output the sequentially designated sub-groups of said speech data group, whereby said oral statements defined by said sub-groups of said each speech data group are provided by said emitting means upon said repeated operations of said each button.

4,489,437

SPEECH SYNTHESIZER

Takuro Fukuichi; Yasuo Kusumoto; Sumio Fujita, and Shuji Kawamura, all of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Jan. 27, 1982, Ser. No. 343,198
Claims priority, application Japan, Jan. 29, 1981, 56-11871
Int. Cl.³ G10L *1/00*
U.S. Cl. 381—51 **4 Claims**



1. A speech synthesizer using variable frame lengths obtained by multiplication of a pitch period analyzed from original speech by the number of repetitions of substantially the same waveform as that in said pitch period comprising:

first circuit means for determining a frame interval (T_f) from pitch data (PITCH) and repeat times (REPEAT) in speech data,

second circuit means for determining a PARCOR coefficient interpolation period (Δt) from the determined frame interval (T_f) and for generating a PARCOR coefficient interpolation timing signal (C_1) every PARCOR coefficient interpolation in response to an output of said first circuit means,

third circuit means for producing a PARCOR coefficient interpolation value (Δki) per one PARCOR coefficient interpolation from said PARCOR coefficient interpolation period (Δt) and PARCOR coefficients of two adjacent frames in synchronism with said PARCOR interpolation timing signal (C_1),

fourth circuit means for executing a PARCOR coefficient interpolation in order by using said PARCOR coefficient interpolation value (Δki) in synchronism with said interpolation timing signal (C_1) from said second circuit means,

fifth circuit means for determining an amplitude interpolation period in synchronism with pitch period and for generating an amplitude interpolation timing signal (C_2),

sixth circuit means for producing an amplitude interpolation value (ΔAMP) per one amplitude interpolation from said amplitude interpolation period and amplitudes of two adjacent frames in response to said amplitude interpolation timing signal (C_2) from said fifth circuit means,

seventh circuit means for executing an amplitude interpolation in synchronism with said amplitude interpolation timing signal (C_2),

digital filter means for receiving interpolated speech data including PARCOR coefficient and amplitude, and acoustic means for generating a speech sound in response to an output of said digital filter means.

4,489,438

AUDIO RESPONSE SYSTEM

Steve A. Hughes, Doraville, Ga., assignor to National Data Corporation, Atlanta, Ga.

Filed Feb. 1, 1982, Ser. No. 344,505
Int. Cl.³ G10L *1/00*
U.S. Cl. 381—51 **18 Claims**

1. A system for receiving line signals including tone signals comprising tone coded information request messages from a

telephone line, and transmitting synthesized human voice response messages along the same line, comprising:

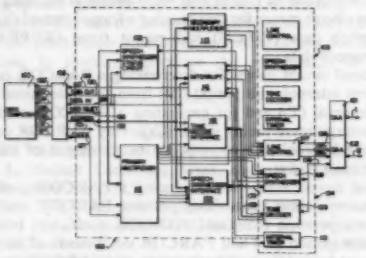
a programmed computer;

line control circuit means connected to said telephone line for connecting said telephone line to said system and disconnecting said telephone line from said system and for producing an off hook signal in response to an incoming line signal on said telephone line;

tone decode circuit means connected to said telephone line for producing digital signals in response to received tone signals, said tone decode circuit means including means for producing a decoder status signal in response to a received tone signal;

voice synthesizing means connected to said telephone line for producing a synthesized voice signal, said voice synthesizing means including a storage buffer for storing data to be synthesized, and means for producing a buffer status signal when said buffer is loaded to a predetermined amount;

interface circuit means for establishing communication between said line control circuit means and said computer, between said voice synthesizing means and said computer, and between said computer and said tone decode circuit



means, said interface circuit means including: interrupt circuit means connected to receive said off hook signal, said status decoder signal, and said buffer status signal; and causing an interrupt signal to be transmitted to said computer in response to said off hook signal, said status decoder signal or said buffer status signal status check means for storing an indication of the circuit causing said interrupt signal, and a tone decode interface for receiving digital signals from said tone decode circuit means and transmitting said digital signals to said computer in serial format;

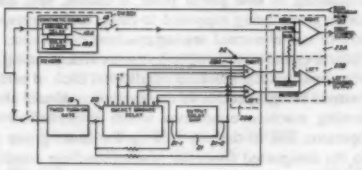
said computer being programmed to interrogate said status check means in response to said interrupt signal and to communicate to said circuit causing said interrupt signal through said interface circuit means to selectively acknowledge an incoming call to said line control circuit means, provide response messages to be synthesized to said voice synthesizing means, and to accept digital signals from said tone decode circuit means through said tone decode interface, said computer further being programmed to determine appropriate responses to decoded request messages received through said tone decode interface and to load said storage buffer with data representing said response.

4,489,439

ELECTRONIC STEREO REVERBERATION DEVICE WITH DOUBLER

Donald T. Scholz, Wayland, and Neil A. Miller, Newtonville, both of Mass., assignors to Scholz Research & Development, Waltham, Mass.

Filed Sep. 20, 1982, Ser. No. 420,282
Int. Cl.³ H03G *3/00*
U.S. Cl. 381—63 **20 Claims**



9. An electronic reverberation system for providing reverberation to signals in the audio frequency range, comprising;

a reverberation circuit for receiving a main input audio signal and providing audio output signals having different delay components including at least first and second audio reverberation output signals;

a doubling circuit for receiving the main input audio signal and for providing an output signal whose pitch varies from the pitch of said inputted signal; and

two output mixers, each of which respectively receives the first and second audio reverberation output signals and wherein the output mixers also receive the output signals from said doubling circuit and the main input audio signal, and wherein the output mixers combine the signals inputted thereto to provide two audio signals having different audio characteristics.

16. An electronic reverberation device for providing reverberation to signals in the audio frequency range, comprising:

a timed input delay circuit including an input terminal for receiving the audio signal, an output terminal, and a gate means for gating from the input to the output terminal thereof, only those audio signals which have a duration longer than a predetermined time interval;

a delay means for receiving the gated output signals from said timed input delay circuit for providing at least two different delayed output signals;

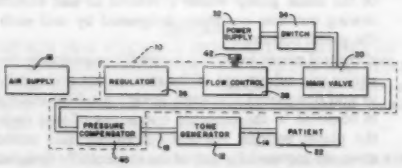
and an output means which receives the delayed output signals from said delay means and which provides audio output signals having different delay components.

4,489,440

PRESSURE-COMPENSATED PNEUMATIC SPEECH SIMULATOR

Samir M. Chaoui, Brea, Calif., assignor to Bear Medical Systems, Inc., Riverside, Calif.

Filed Oct. 14, 1983, Ser. No. 542,169
Int. Cl.³ A61F *1/20*
U.S. Cl. 381—70 **20 Claims**



1. A pneumatic speech simulator, of the type having means defining a flow path for conducting a flow of pressurized air from a source into the throat of a patient, tone-generating

means in said flow path, said tone generating means being responsive to air pressures within a predetermined range to produce an audible tone, and means actuatable by said patient for controllably starting and stopping said flow of air, wherein the improvement comprises:

pressure responsive means in said flow path for maintaining the pressure experienced by said tone-generating means within said predetermined range as the pneumatic resistance of said flow path downstream from said tone-generating means increases.

4,489,441

METHOD AND APPARATUS FOR CANCELLING VIBRATION

George B. B. Chaplin, Colchester, England, assignor to Sound Attenuators Limited, Essex, United Kingdom

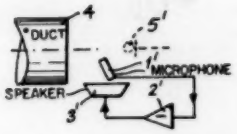
PCT No. PCT/GB80/00201, § 371 Date Jul. 15, 1981, § 102(e) Date Jul. 15, 1981, PCT Pub. No. W081/01480, PCT Pub. Date May 28, 1981

Continuation of Ser. No. 285,104, Jul. 15, 1981, abandoned. This PCT application filed Nov. 21, 1983, Ser. No. 540,905

Claims priority, application PCT Int'l Appl., Nov. 21 1980, WO80/00201; United Kingdom, Nov. 21, 1979, 7940325; Jan. 14, 1980, 8001155

Int. Cl.³ G10K *11/16*; H04R *1/28*

U.S. Cl. 381—71 **9 Claims**



1. A method of attenuating, in a desired location, a primary vibration entering that location from a primary source of vibration, which method comprises injecting into that location a secondary vibration of such waveform shape and amplitude that it will at least partially cancel the effect of the primary vibration in the desired location, the secondary vibration being generated by an amplifying/phase-shifting feedback loop linking a vibration-sensing transducer means, receiving both the secondary and primary vibrations and a closely proximate vibration-transmitting transducer means serving as the source of the secondary vibration, wherein the vibration-sensing transducer means is a directional microphone arranged to monitor both the primary and the secondary vibrations but to be less sensitive to the generated secondary vibration than to the primary vibration and the output from the vibration-transmitting transducer means is adjusted so that (a) the waveform shape of the secondary vibration generated by the said loop is the waveform shape which would be capable of cancelling the primary vibration at the location of the directional microphone and (b) the amplitude of said waveform is such that the at least partial cancellation produced by coaction between the secondary and primary vibrations, occurs at a position within the location which is spaced from the vibration-transmitting transducer means by a distance greater than the distance between the said directional microphone and the vibration-transmitting transducer means.

4,489,442

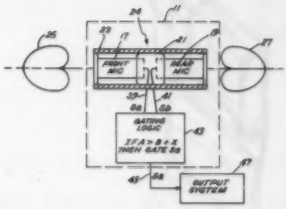
SOUND ACTUATED MICROPHONE SYSTEM

Carl R. Anderson, Wilmette; William R. Bevan; Robert B. Schulein, both of Evanston, all of Ill., and Alan D. Smith, Lubbock, Tex., assignors to Shure Brothers, Inc., Evanston, Ill.

Filed Sep. 30, 1982, Ser. No. 429,430

Int. Cl.³ H04R *3/00*; H04M *3/56*

U.S. Cl. 381—81 **14 Claims**



1. A sound system having an amplifying means responsive to a microphone signal for amplifying said signal, said system comprising:

a microphone housing;

a microphone array secured within said housing and having a first microphone element with directional characteristics such that the relative sound sensitivity of said first element varies in accordance with the angle of incidence of sound relative to said element, and having at least a second microphone element secured in said housing in a fixed relationship to said first element, each of said microphone elements for receiving sound and each for generating a respective output signal, the ratio of the amplitudes (differences in decibels) of said output signals of said first and second elements being a function of the angle of incidence of the sound relative to said array;

logic circuit means for receiving each said respective output signals from at least said first and second microphone elements, said logic circuit responding to at least one said ratio to determine if the sound is incident from a particular area of space, said logic circuit means generating a gating signal solely when said sound is incident from said particular area of space; and

gate circuit means responsive to said gating signal for passing the said output signal of at least one microphone element of said array to said amplifying means for amplification.

DESIGNS

DECEMBER 18, 1984

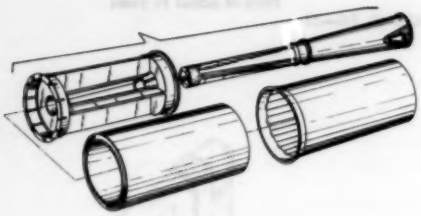
276,759
BOOT TREE
Elizabeth Inspector, 14 Saint Malo, Pine Brook, N.J. 07058
Filed Jan. 17, 1983, Ser. No. 458,203
Term of patent 14 years
U.S. Cl. D2—378.1

276,760
BELT-ATTACHED CAN HOLDER
Lloyd M. Kesterson, 1450 Woodberry La., Roseburg, Oreg. 97470
Filed Apr. 28, 1982, Ser. No. 372,467
Term of patent 14 years
U.S. Cl. D2—400

276,761
FIELD CASE FOR A CAMERA
Vincent F. Lang, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Apr. 5, 1982, Ser. No. 365,841
Term of patent 14 years
U.S. Cl. D3—33

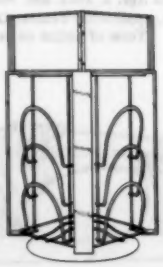
276,762
HANDLE FOR A BAG
Maxime Parrochia, Quartier l'Ilate, La Verpilliere, France 38290
Filed Apr. 1, 1982, Ser. No. 364,332
Claims priority, application France, Oct. 23, 1981, 813655
Term of patent 14 years
U.S. Cl. D3—54

276,763
LINT REMOVER
Nicholas D. McKay, Grand Blanc, Mich., assignor to Helmac Products Corporation, Flint, Mich.
Filed Aug. 6, 1981, Ser. No. 290,722
Term of patent 14 years
U.S. Cl. D4—122



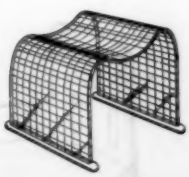
276,764
COMBINED TABLE AND MULTIPLE CHAIR UNIT FOR CHILDREN
Duane Shipman, 1209 Smiling Rd., and Byron L. Walker, 3604 Smoky Hollow Rd., both of Edmond, Okla. 73034
Filed Mar. 5, 1982, Ser. No. 354,944
Term of patent 14 years
U.S. Cl. D6—338

276,765
DISPLAY RACK
Myron L. Denhoff, New York, N.Y., assignor to Myden Industries, Inc., New York, N.Y.
Filed Jun. 28, 1982, Ser. No. 393,176
Term of patent 14 years
U.S. Cl. D6—458



276,766
CHAIR
Denny M. Truette, Pineville, N.C., assignor to Pellon and Crane Company, Charlotte, N.C.
Filed Jun. 3, 1982, Ser. No. 384,803
Term of patent 14 years
U.S. Cl. D6—366

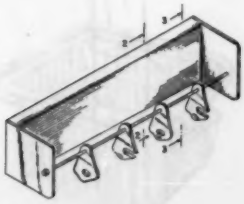
276,767
OTTOMAN
Vittorio Livi, Pesaro, Italy, assignor to FIAM S.r.l., Italy
Filed Mar. 17, 1981, Ser. No. 244,632
Term of patent 14 years
U.S. Cl. D6—349



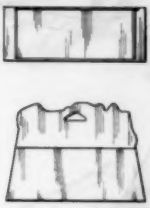
276,768
CHAIR
Axel Enthoven, Wijnegem, Belgium, assignor to Robe Design B.V., Noordwolde, Netherlands
Filed Aug. 31, 1982, Ser. No. 414,236
Claims priority, application International Patent In, Mar. 2, 1982, DM/001265
Term of patent 14 years
U.S. Cl. D6—379

276,769
ARMCHAIR
Andre Jarry, 10,140 Curotte St., Montreal, Quebec, Canada H2C 2Y6
Filed Jan. 29, 1982, Ser. No. 343,881
The portion of the term of this patent subsequent to Sep. 14, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—372

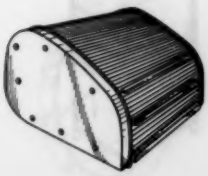
276,770
TIE RACK
Byrtle R. Kean, 391 E. Grant St., East Palestine, Ohio 44413
Filed Sep. 20, 1982, Ser. No. 419,951
Term of patent 14 years
U.S. Cl. D6—323



276,771
VERTICALLY MOUNTABLE CONTAINER
Mark Margolis, Bloomington, Minn., assignor to Spearhead Industries, Inc., Minn.
Filed Jan. 4, 1982, Ser. No. 337,027
Term of patent 14 years
U.S. Cl. D6—553



276,772
ROLL-TOP CABINET
Robert R. Snediker, Winnetka, Ill., assignor to Chicago Show Printing Company, Morton Grove, Ill.
Filed Feb. 9, 1978, Ser. No. 876,424
The portion of the term of this patent subsequent to Sep. 18, 1995, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—433



276,773

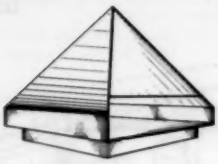
DISPLAY CABINET FOR BOTTLES OR THE LIKE

Alfred Rodriguez, 6200 Annan Way, Los Angeles, Calif. 90042

Filed Apr. 29, 1982, Ser. No. 372,924

Term of patent 14 years

U.S. Cl. D6—490



276,774

LECTERN

John Matyear, "Goodwood", Mt. Dandenong Rd., Kalorama, Victoria, Australia

Filed Aug. 20, 1981, Ser. No. 294,544

Term of patent 14 years

U.S. Cl. D6—419

276,775

COMBINED BULK FOOD DISPLAY AND DISPENSER CABINET

Richard D. Antti, and William Jason, both of Fair Oaks, Calif., assignors to Jason & Son, Inc., Rancho Cordova, Calif.

Filed May 28, 1982, Ser. No. 383,064

Term of patent 14 years

U.S. Cl. D6—471

276,776

DISPLAY STAND

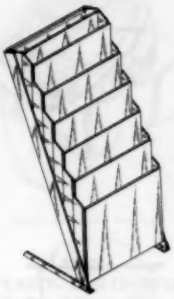
Robert A. Butkus, Oakland, Calif., assignor to Container Corporation of America, Chicago, Ill.

Filed Jan. 18, 1982, Ser. No. 340,455

Term of patent 14 years

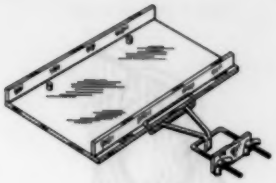
U.S. Cl. D6—473

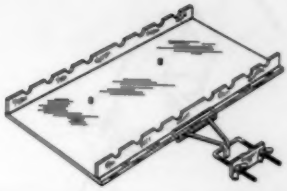
276,777
MAGAZINE HOLDER OR THE LIKE
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Hawthorne, Calif.
Filed Oct. 16, 1981, Ser. No. 312,146
Term of patent 14 years
U.S. Cl. D6—473



276,778
TABLE FRAME
Hall Bradley, Pasadena, Calif., assignor to Brown Jordan Company, El Monte, Calif.
Filed Jul. 21, 1982, Ser. No. 400,314
Term of patent 14 years
U.S. Cl. D6—499

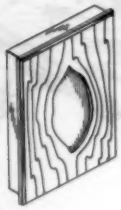
276,779
MUSIC STAND ACCESSORY TRAY
Harold M. Gomez, 7 Beachview Crescent, Toronto, Ontario, Canada M4E 2L4
Filed Jul. 1, 1982, Ser. No. 394,240
Term of patent 14 years
U.S. Cl. D6—418





276,780
FRAME
John F. Kristofich, 25 Jacob Rd., Washington Township, N.J.
Filed Dec. 9, 1982, Ser. No. 448,385
Term of patent 14 years
U.S. Cl. D6—311

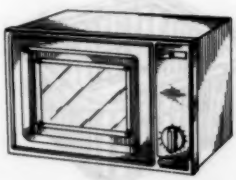
276,781
SHADOW BOX
Harold K. McIntire, Jr., 1305 Upper Bellbrook Rd., Xenia, Ohio 45385
Filed Mar. 19, 1982, Ser. No. 359,931
Term of patent 14 years
U.S. Cl. D6—306



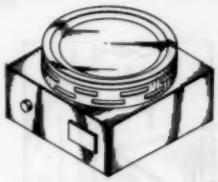
276,782
MUG OR SIMILAR ARTICLE
Steve A. Unger, Manlius, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Division of Ser. No. 379,174, May 17, 1982,. This application Mar. 23, 1984, Ser. No. 592,848
Term of patent 14 years
U.S. Cl. D7—9

276,783
FOOD CONTAINER/HOLDER
John C. Hollenbeck, deceased, late of Woodacre, Calif., assignor to Leslie J. Klein, administrator, San Rafael, Calif.
Filed Jul. 21, 1982, Ser. No. 400,272
Term of patent 14 years
U.S. Cl. D7—16

276,784
MICROWAVE OVEN
Yukiie Ohyama; Makoto Nakagawaji, both of Shiga, and Masanori Inoue, Kyoto, all of Japan, assignors to Sanyo Electric Co., Ltd., Tokyo, Japan
Filed Dec. 17, 1982, Ser. No. 450,737
Claims priority, application Japan, Jun. 18, 1982, 57-27442; Jun. 22, 1982, 57-28070
Term of patent 14 years
U.S. Cl. D7—351



276,785
COFFEEMAKER BASE
Robert K. Cleland, 11051 Via El Mercado, Los Alamitos, Calif. 90720
Filed Oct. 9, 1981, Ser. No. 310,096
Term of patent 14 years
U.S. Cl. D7—399



276,786
PLASTIC BAG OPENER
Joyce Chen, 45 Stella Rd., Belmont, Mass. 02178
Filed Feb. 24, 1982, Ser. No. 351,855
Term of patent 14 years
U.S. Cl. D8—41

276,787
COMBINED CHAMPAGNE AND WINE BOTTLE STOPPER REMOVER
Charles H. Burns, 11722 Sela La., Houston, Tex. 77072
Filed May 24, 1982, Ser. No. 381,611
Term of patent 14 years
U.S. Cl. D8—18

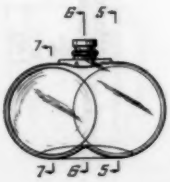
276,788
CORK EJECTOR
Fred A. Ravreby, Framingham, Mass., assignor to Alon Products Inc., New York, N.Y.
Filed Feb. 26, 1982, Ser. No. 352,413
Term of patent 14 years
U.S. Cl. D8—42

276,789
HOLDING MEANS FOR CHUCK WRENCH
Torbjörn Olsen, PL. 5172, Österling, S-533 00 Götene, Sweden
Filed Dec. 7, 1982, Ser. No. 447,501
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1982, URA 700/82
Term of patent 14 years
U.S. Cl. D8—71

276,790
BOTTLE
Eckhard Laske, Leuterschach, Fed. Rep. of Germany, assignor to Sailerbrau Franz Sailer, Leuterschach, Fed. Rep. of Germany
Filed May 6, 1982, Ser. No. 375,377
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1982, IV 3786
Term of patent 14 years
U.S. Cl. D9—378

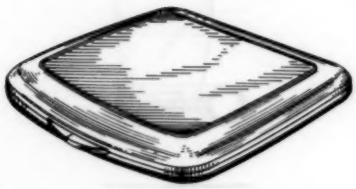
276,791
BOTTLE
William D. Field, Chicago, Ill., assignor to Consolidated Royal Chemical Corporation, Chicago, Ill.
Filed Jul. 6, 1982, Ser. No. 395,826
Term of patent 14 years
U.S. Cl. D9—382

276,792
BOTTLE
Serge Mansau, Neuilly sur Seine, France, assignor to American Cyanamid Co., Stamford, Conn.
Filed Jun. 18, 1982, Ser. No. 389,649
Claims priority, application France, Jan. 15, 1982, 820110
Term of patent 14 years
U.S. Cl. D9—403

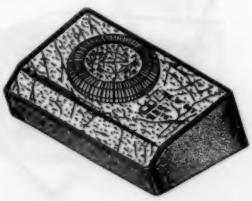


276,793
PACKAGING CONTAINER FOR RAZORS
Richard D. Richards, Liphook, England, assignor to Wilkinson Sword, Ltd., England
Filed Dec. 2, 1981, Ser. No. 326,954
Claims priority, application United Kingdom, Jun. 12, 1981, 1000975
Term of patent 14 years
U.S. Cl. D9—415

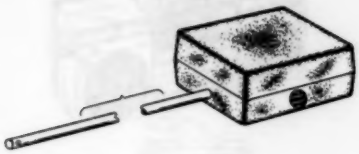
276,794
PACKAGING CONTAINER
Kenard E. Urion, Woodbury, N.J., assignor to Scott Paper Company, Philadelphia, Pa.
Filed Jul. 12, 1982, Ser. No. 397,503
Term of patent 14 years
U.S. Cl. D9—420

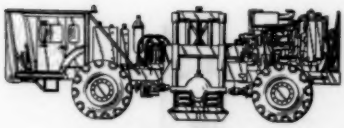


276,795
TIMING DEVICE
Michael S. Joss, Chicago, and Steven P. Beiletire, Oak Park, both of Ill., assignors to AMF Inc., White Plains, N.Y.
Division of Ser. No. 137,208, Apr. 4, 1980, Pat. No. Des. 255,663. This application Jun. 11, 1982, Ser. No. 374,497
Term of patent 14 years
U.S. Cl. D10—40

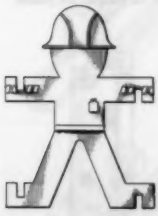


276,796
PORTABLE ELECTRICAL RESISTANCE SENSING WAND
David G. Allender, Jr., 1651 Parrott Dr., San Mateo, Calif. 94402
Filed Jul. 2, 1981, Ser. No. 279,870
The portion of the term of this patent subsequent to Aug. 9, 1997, has been disclaimed.
Term of patent 14 years
U.S. Cl. D10—56

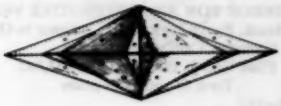


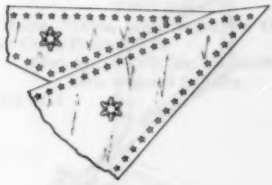


276,797
SECTION FOR A PORTABLE WARNING BARRICADE
Robert L. Narens, 2525 Salceda Dr., Northbrook, Ill. 60062, and Frank D. Billeck, 456 Chicory La., Buffalo Grove, Ill. 60090
Filed Jun. 9, 1982, Ser. No. 386,748
Term of patent 14 years
U.S. Cl. D10—109

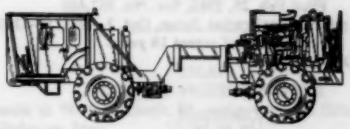


276,798
CHRISTMAS STAR ORNAMENT OR SIMILAR ARTICLE
N. J. Joseph, 21 N. Albany Ave., Atlantic City, N.J. 08401
Filed Apr. 23, 1982, Ser. No. 371,222
Term of patent 14 years
U.S. Cl. D11—125



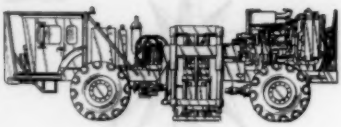


276,799
SEISMIC EXPLORATION VEHICLE
Marvin G. Bays, and James L. Carothers, both of Ponca City, Okla., assignors to Mertz, Inc., Ponca City, Okla.
Filed Mar. 10, 1981, Ser. No. 242,357
Term of patent 14 years
U.S. Cl. D12—1



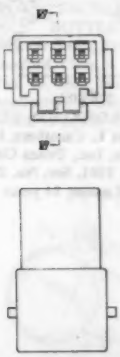
276,800
SEISMIC EXPLORATION VEHICLE
Marvin G. Bays, and James L. Carothers, both of Ponca City, Okla., assignors to Mertz, Inc., Ponca City, Okla.
Filed Mar. 10, 1981, Ser. No. 242,359
Term of patent 14 years
U.S. Cl. D12—1

276,801
SEISMIC EXPLORATION VEHICLE
Marvin G. Bays, and James L. Carothers, both of Ponca City, Okla., assignors to Mertz, Inc., Ponca City, Okla.
Filed Mar. 10, 1981, Ser. No. 242,360
Term of patent 14 years
U.S. Cl. D12—1

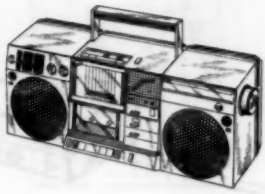


276,802
SIDE MIRROR FOR AN AUTOMOTIVE VEHICLE
Ernesto R. Haack, Buena Park, Calif., assignor to Orion Industries, Inc., Compton, Calif.
Filed Oct. 8, 1982, Ser. No. 433,542
Term of patent 14 years
U.S. Cl. D12—187

276,803
CONNECTOR HOUSING
Yasuharu Moriai, Suzuka; Yoshio Ito, Yokkaichi, and Atsushi Sakatani, Matsusaka, all of Japan, assignors to Tokai Electric Wire Co., Ltd., Yokkaichi, Japan
Filed Feb. 25, 1982, Ser. No. 352,460
Claims priority, application Japan, Oct. 1, 1981, 56-43802
Term of patent 14 years
U.S. Cl. D13—24



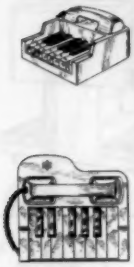
276,804
COMBINED PORTABLE CASSETTE RECORDER AND RADIO
Moritaka Taniguchi, Tachikawa; Atsuhiko Urushihara, Koganei, and Norio Takei, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jun. 16, 1982, Ser. No. 389,078
Claims priority, application Japan, Jan. 8, 1982, 57-142
Term of patent 14 years
U.S. Cl. D14—5



276,805
LOUDSPEAKER CABINET
Steven J. Eberbach, 950 Fountain St., Ann Arbor, Mich. 48103
Filed Jun. 17, 1982, Ser. No. 389,225
Term of patent 14 years
U.S. Cl. D14—33

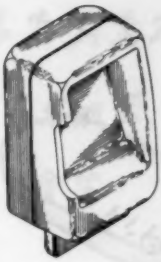
276,806
LOUDSPEAKER CABINET
Steven J. Eberbach, 950 Fountain St., Ann Arbor, Mich. 48103
Filed Jun. 17, 1982, Ser. No. 389,226
Term of patent 14 years
U.S. Cl. D14—33

276,807
TELEPHONE SET
Jeffrey D. Stein, 10060 Willow Creek Rd., San Diego, Calif. 92131
Filed Feb. 16, 1982, Ser. No. 348,904
Term of patent 14 years
U.S. Cl. D14—53

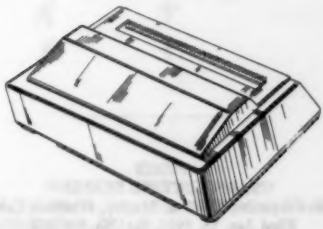


276,808
TELEPHONE FOR AUTOMOBILES
Yoshifumi Fukutani, Chiba, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Sep. 29, 1982, Ser. No. 428,130
Claims priority, application Japan, May 26, 1982, 57-22744
Term of patent 14 years
U.S. Cl. D14—53

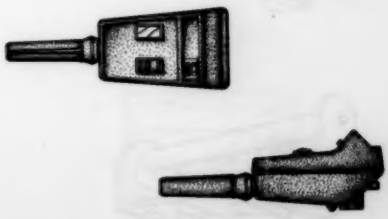
276,809
TELEPHONE HANDSET RECEPTACLE OR SIMILAR ARTICLE
Terrance N. Taylor, Cary, Ill., assignor to Motorola Inc., Schaumburg, Ill.
Filed May 6, 1982, Ser. No. 375,647
Term of patent 14 years
U.S. Cl. D14—60



276,810
PRINTER
David E. Roche, Nashua, N.H., assignor to Centronics Data Computer Corp., Hudson, N.H.
Filed Apr. 2, 1979, Ser. No. 26,084
Term of patent 14 years
U.S. Cl. D14—111

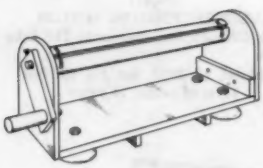


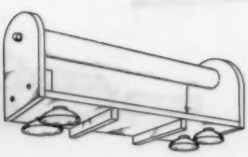
276,811
ELECTRIC FISHING MOTOR
Donald G. Wolfe, Chicago, Ill., assignor to The Eska Company, Dubuque, Iowa
Filed Jul. 22, 1982, Ser. No. 400,740
Term of patent 14 years
U.S. Cl. D15—4



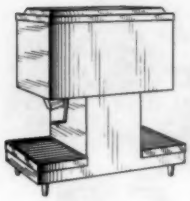
276,812
KNEADING MIXER
Yukio Kanazawa, No. 880, Sekishi-cho, Hamamatsu-shi, Shizuoka-ken, Japan
Filed Apr. 12, 1982, Ser. No. 368,021
Term of patent 14 years
U.S. Cl. D15—19

276,813
YARN CUTTING STAND
Bertram F. Carpenter, 12307 E. Hadley, Whittier, Calif. 90601
Filed Jan. 15, 1982, Ser. No. 339,373
Term of patent 14 years
U.S. Cl. D15—77

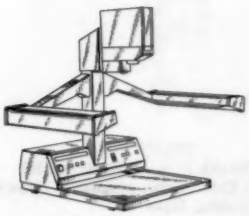




276,814
ICE DISPENSER
Robert M. Koeneman, Elmwood Park, and Albert L. Schafer, Chicago, both of Ill., assignors to Remcor Products Company, Franklin Park, Ill.
Filed Sep. 27, 1982, Ser. No. 424,319
Term of patent 14 years
U.S. Cl. D15—80



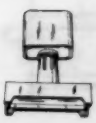
276,815
MICROFILM COPYING CAMERA
Masahiro Kando, and Hiroaki Suzuki, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 13, 1982, Ser. No. 434,068
Claims priority, application Japan, Apr. 28, 1982, 57-18703
Term of patent 14 years
U.S. Cl. D16—27



276,816
HAND-HELD PERISCOPE
Barry G. Merrill, P.O. Box 96, Sallisaw, Okla. 74955
Filed Jun. 9, 1983, Ser. No. 502,810
Term of patent 14 years
U.S. Cl. D16—130

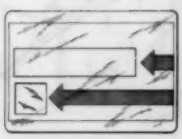
276,817
GUITAR
Charles H. Kaman, Prattling Pond Rd., Farmington, Conn. 06032
Division of Ser. No. 257,190, Apr. 24, 1981, , which is a continuation-in-part of Ser. No. 210,144, Nov. 24, 1980,. This application Jul. 11, 1983, Ser. No. 512,623
Term of patent 14 years
U.S. Cl. D17—14

276,818
OFFICE STAMP
Per-Arne Carlsson, Tärngatan 7, and Bengt Darhult, Trastgatan 12, both of 510 54 Brämhult, Sweden
Filed Mar. 17, 1982, Ser. No. 358,953
Term of patent 14 years
U.S. Cl. D18—15

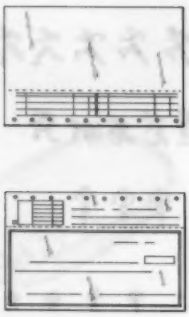


276,819
VIDEO GRAPHICS FIGURE FONT OR THE LIKE
David F. James, Redondo Beach, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Division of Ser. No. 973,772, Dec. 27, 1978, abandoned. This application Aug. 7, 1981, Ser. No. 290,896
Term of patent 14 years
U.S. Cl. D18—27

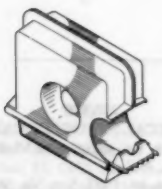
276,820
MEDICAL SECURITY CARD
Kenneth A. Lill, Burke, Va., assignor to Medical Security Card, Inc., Cliffside Park, N.J.
Filed Apr. 14, 1982, Ser. No. 368,244
Term of patent 14 years
U.S. Cl. D19—10



276,821
COMBINED CHECK AND CHECK STUB
John L. Bateman, Cockeysville, Md., assignor to American Standard Inc., New York, N.Y.
Filed Dec. 18, 1981, Ser. No. 332,280
Term of patent 14 years
U.S. Cl. D19—11

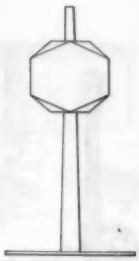


276,822
TAPE DISPENSER
Rodney D. Borst, Oregan, Wis., assignor to Placon Corporation, Madison, Wis.
Filed Aug. 9, 1982, Ser. No. 406,398
Term of patent 14 years
U.S. Cl. D19—69

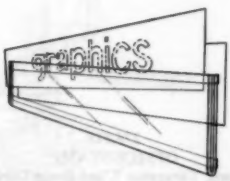


276,823
DISPLAY DEVICE FOR WOMEN'S SHOES
Roger P. Mueller, Skaneateles, N.Y., assignor to RPM Industries, Inc., Auburn, N.Y.
Filed Jul. 26, 1982, Ser. No. 402,210
Term of patent 14 years
U.S. Cl. D20—10

276,824
SIGN
Fritz W. Wilde, Robert-Koch-Strasse 11, D-8012 Ottobrunn, Fed. Rep. of Germany
Filed Mar. 5, 1982, Ser. No. 355,161
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1981, 8126382[U]
Term of patent 14 years
U.S. Cl. D20—41



276,825
SIGN SUPPORT BRACKET
Gordon W. Eason, 1326 Larkmoor, Berkley, Mich. 48072
Filed Oct. 7, 1982, Ser. No. 433,312
Term of patent 14 years
U.S. Cl. D20—43



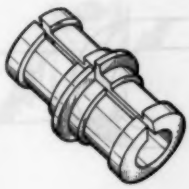
276,826
GAME CARD HOLDER
W. Dee Trepanier, 5362 Via Aquario, San Diego, Calif. 92111, and Joseph E. Dumond, 9217 Penmar, Santee, Calif. 92071
Filed Jan. 27, 1982, Ser. No. 343,064
Term of patent 14 years
U.S. Cl. D21—54

276,827
RATTLE
Bryn Jones, 28 Thomas St., Llanbradach, Caerphilly, Wales
Filed Jun. 24, 1982, Ser. No. 391,961
Claims priority, application United Kingdom, Jan. 8, 1982, 1004521
Term of patent 14 years
U.S. Cl. D21—65

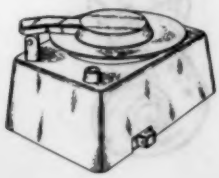
276,828
SCOOTER
Mike Sampson, Coventry, England, assignor to F. Watson (Hardware) Limited, London, England
Filed Jun. 7, 1982, Ser. No. 385,890
Term of patent 14 years
U.S. Cl. D21—81

276,829
AERIAL TOY
Eugene S. Bernatek, 3635 Lakefield, San Antonio, Tex. 78230
Filed Sep. 20, 1982, Ser. No. 419,783
Term of patent 14 years
U.S. Cl. D21—98

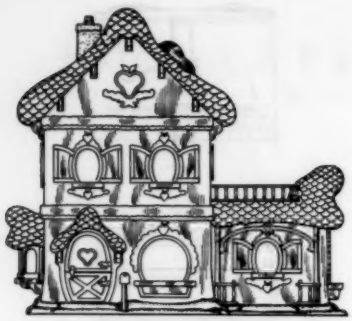
276,830
TOY CONSTRUCTION PIECE
Nils A. I. Petersson, Killeberg, Sweden, assignor to Brio Toy AB, Osby, Sweden
Filed Jul. 16, 1982, Ser. No. 398,937
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1982, URA 69/82
Term of patent 14 years
U.S. Cl. D21—108



276,831
TOY PHONOGRAPH
Mel Appel, Livingston, and George Kress, Scotch Plains, both of N.J., assignors to Mel Appel, Livingston, N.J.
Filed May 21, 1982, Ser. No. 380,616
Term of patent 14 years
U.S. Cl. D21—112



276,832
DOLL HOUSE
David Winslow, and Stephen M. Toth, both of Cincinnati, Ohio, assignors to American Greetings Corporation, Cleveland, Ohio
Filed Sep. 29, 1982, Ser. No. 427,059
Term of patent 14 years
U.S. Cl. D21—114

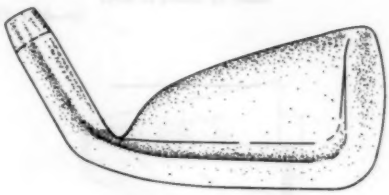


276,833
COUPLING DEVICE FOR MINIATURE TOY TRAIN VEHICLES
Robert J. Byers, 420 Zang St., N. 3-302, Lakewood, Colo. 80228
Filed Jan. 19, 1982, Ser. No. 340,806
Term of patent 14 years
U.S. Cl. D21—141

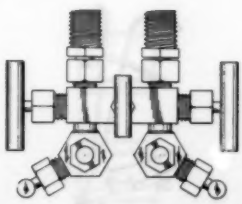
276,834
TOY SEAHORSE
Terry Paczko, Cleveland, Ohio, assignor to Questor Corp., Tampa, Fla.
Filed Sep. 30, 1982, Ser. No. 431,663
Term of patent 14 years
U.S. Cl. D21—157

276,835
EXERCISE BAR
Robert H. Killen, Pasadena, Calif., assignor to Gravity Guidance, Inc., Duarte, Calif.
Filed Feb. 5, 1982, Ser. No. 346,008
Term of patent 14 years
U.S. Cl. D21—198

276,836
GOLF CLUB HEAD
Raymon W. Cook, San Antonio, Tex., assignor to Ball-Master Golf Club Company, Inc., San Antonio, Tex.
Filed Jun. 9, 1982, Ser. No. 386,664
Term of patent 14 years
U.S. Cl. D21—220

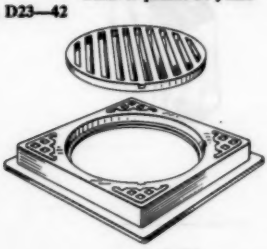


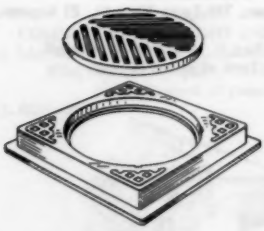
276,837
EQUALIZING VALVE MANIFOLD
Robert W. Evans, 12345 Southeast Greiner La., Portland, Oreg. 97236
Filed Sep. 13, 1982, Ser. No. 416,883
Term of patent 14 years
U.S. Cl. D23—21



276,838
FAUCET HANDLE DESIGN
Charles P. Hill, Indianapolis, and Anthony G. Spangler, Westfield, both of Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.
Filed Aug. 26, 1982, Ser. No. 411,865
Term of patent 14 years
U.S. Cl. D23—28

276,839
CATCH BASIN
Archibald H. R. McCoy, R.R. No. 1, Troy, Ontario, Canada
Filed Jul. 6, 1982, Ser. No. 395,818
Term of patent 14 years
U.S. Cl. D23—42





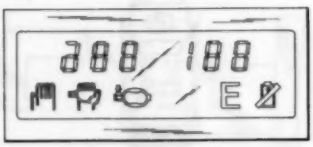
276,840
ELECTRIC ROOM HEATER
Rocco L. Church, Auburn, N.Y., assignor to Patco Energy, Inc., Auburn, N.Y.
Filed Jun. 7, 1982, Ser. No. 385,837
Term of patent 14 years
U.S. Cl. D23—119

276,841
ELECTRIC ROOM HEATER
Rocco L. Church, Auburn, N.Y., assignor to Patco Energy, Inc., Auburn, N.Y.
Filed Jun. 10, 1982, Ser. No. 387,027
Term of patent 14 years
U.S. Cl. D23—121

276,842
HOUSING FOR FAN ACCESSORY FOR HEATER
Donald G. Porter, 8620 Wilkinson Blvd., Charlotte, N.C. 28208
Filed Jan. 8, 1982, Ser. No. 337,973
Term of patent 14 years
U.S. Cl. D23—127

276,843
CONDENSING UNIT HOUSING FOR AN AIR CONDITIONING SYSTEM
Walter W. Hoyle, Fayetteville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Sep. 29, 1982, Ser. No. 427,207
Term of patent 14 years
U.S. Cl. D23—139

276,844
ELECTROOPTIC DISPLAY FOR BLOOD PRESSURE DEVICE
David W. Eaton, Canton, Conn., assignor to Timex Medical Products Corporation, Waterbury, Conn.
Filed Apr. 19, 1982, Ser. No. 369,705
Term of patent 14 years
U.S. Cl. D24—21



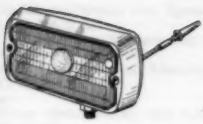
276,845
TOY KITTEN TEETHER
Valerie Daugherty, Alta Loma, Calif., assignor to Questor Corp., Tampa, Fla.
Filed Sep. 30, 1982, Ser. No. 431,658
Term of patent 14 years
U.S. Cl. D24—45

276,846
SANITARY NAPKIN
Leif U. R. Widlund, and Stig S. Nedestam, both of Mölnlycke, Sweden, assignors to Mölnlycke Aktiebolag, Gothenburg, Sweden
Filed Sep. 28, 1982, Ser. No. 425,268
Claims priority, application Sweden, Apr. 1, 1982, 82-0857
Term of patent 14 years
U.S. Cl. D24—51

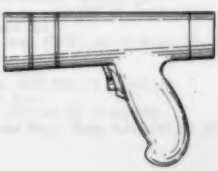
276,847
MEDICAL AEROSOL INHALATION DEVICE
Sven G. Nyman, Dalby, Sweden; Kaija A. Snellman-Wasenius, Söderkulla, and Risto Virtanen, Nurmiärvi, both of Finland, assignors to Aktiebolaget Draco, Sweden
Filed Mar. 11, 1982, Ser. No. 357,178
Claims priority, application Sweden, Sep. 21, 1981, 81-2035
Term of patent 14 years
U.S. Cl. D24—62

276,848
PORTABLE HOME
Richard L. Stevenson, 738 Loma Vista St., El Segundo, Calif. 90245
Filed Nov. 9, 1982, Ser. No. 440,368
Term of patent 14 years
U.S. Cl. D25—22

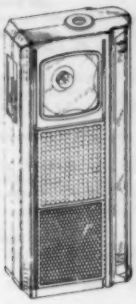
276,849
HEADLIGHT
Francois Bailly, Neuilly sur Seine, France, assignor to Equipements Automobiles Marchal, Issy-les-Moulineaux, France
Continuation of Ser. No. 160,300, Jun. 17, 1980,. This application Oct. 18, 1982, Ser. No. 434,846
Claims priority, application France, Oct. 1, 1979, 77.915
Term of patent 14 years
U.S. Cl. D26—29



276,850
COMBINED FLASHLIGHT AND CLOCK
John A. McCollum, 303 Barnes St., Rockhill, S.C. 29730
Filed Feb. 23, 1982, Ser. No. 351,392
Term of patent 14 years
U.S. Cl. D26—38



276,851
MULTI-FUNCTION PORTABLE LANTERN
Chung S. Leung, Tsuen Wan, N.T., Hong Kong, assignor to Foster Industries Company Limited, Tsuen Wan N.T., Hong Kong
Filed Mar. 2, 1982, Ser. No. 353,971
Claims priority, application United Kingdom, Dec. 1, 1981, 1003914
Term of patent 14 years
U.S. Cl. D26—42



276,852
LAMP
Robert M. Berger, Warren, Vt., assignor to Intercon Purchasing Industries (U.S.A.) Ltd., Forest Hills, N.Y.
Filed Aug. 5, 1982, Ser. No. 405,543
Term of patent 14 years
U.S. Cl. D26—62

276,853
PORTABLE LIGHT SUPPORT OR SIMILAR ARTICLE
Donald D. Sawyer, Beverly Hills, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed Sep. 16, 1982, Ser. No. 418,924
Term of patent 14 years
U.S. Cl. D26—138

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF DECEMBER, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. E. Staley Manufacturing Company: *See*—
Urfer, Allen D.; VanderBurgh, Leonard F.; and McDaniel, Robert S., Jr., 4,488,981, Cl. 252-174.170.

A&L Investment Company: *See*—
Niznick, Gerald A., 4,488,875, Cl. 433-173.000.

AB Asea-Atom: *See*—
Nylund, Olov, 4,489,038, Cl. 376-446.000.

AB Centor SA: *See*—
Larsson, Peter L.; and Brorson, John-Erik B., 4,488,583, Cl. 141-311.00R.

Abbott Laboratories: *See*—
Haviv, Fortuna; and Kerdesky, Francis A. J., 4,489,084, Cl. 424-270.000.

Abe, Ryozo: *See*—
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; and Yoshihara, Kenji, 4,489,398, Cl. 369-32.000.

Abraham, Kuzhikalail M.; Brummer, S. Barry; and Foos, Joseph S. Lithium battery. 4,489,145, Cl. 429-197.000.

Achille, Jean R., to Illinois Tool Works Inc. Reusable one piece drive fastener. 4,488,843, Cl. 411-41.000.

Acker, Rolf-Dieter: *See*—
Becker, Rainer; Oeser, Heinz-Gunter; and Acker, Rolf-Dieter, 4,489,207, Cl. 560-61.000.

Adachi, Keiichi: *See*—
Sakanoue, Kei; Hirano, Shigeo; and Adachi, Keiichi, 4,489,155, Cl. 430-505.000.

Adams, Ladd M.: *See*—
Hayatdavoudi, Asadollah; and Adams, Ladd M., 4,488,607, Cl. 175-65.000.
Puckett, William E.; and Adams, Ladd M., 4,489,223, Cl. 191-12.20R.

Adjustable Bushing Corp.: *See*—
Deutsch, Richard A., 4,488,842, Cl. 411-33.000.

Adria Laboratories, Inc.: *See*—
Cava, Michael P.; and Dominguez, Domingo, 4,489,206, Cl. 549-543.000.

Advanced Control Systems: *See*—
Martin, Thomas B., 4,489,303, Cl. 338-128.000.

Adwest Engineering Ltd.: *See*—
Millard, Barry J., 4,488,615, Cl. 180-148.000.

AE PLC: *See*—
Jones, Kenneth J., 4,488,522, Cl. 123-193.0CP.

Agar, Gordon E. Scheelite flotation process. 4,488,959, Cl. 209-167.000.

Agdanowski, Ronald T., to Sherwood Medical Company. Endotracheal tube assembly. 4,488,548, Cl. 128-204.250.

Ahlstone, Arthur: *See*—
Baugh, Benton F.; Henderson, Herman O., Jr.; Fowler, John H.; and Ahlstone, Arthur, 4,488,740, Cl. 285-84.000.

Ailor, Roscoe M.: *See*—
Scott, Douglas R.; Payne, Frank; and Ailor, Roscoe M., 4,488,341, Cl. 29-156.40R.

Air Products and Chemicals, Inc.: *See*—
Block, Charles S.; and Hong, Sun-Nan, 4,488,967, Cl. 210-605.000.
Hong, Sun-Nan; and Spector, Marshall L., 4,488,968, Cl. 210-605.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Arakawa, Susumu; Tsukigahora, Tooru; and Shirai, Akira, 4,488,404, Cl. 60-535.000.
Itoh, Kouichi, 4,488,680, Cl. 236-93.00A.
Mohri, Kaneo; and Nakane, Takeshi, 4,488,436, Cl. 73-726.000.
Takeda, Shinji; and Hase, Nobutoshi, 4,489,019, Cl. 264-26.000.

Aizawa, Hiroshi: *See*—
Iura, Yukio; Shimizu, Masami; Aizawa, Hiroshi; Tsunekawa, Tokuichi; Uchidoi, Masanori; and Yamamichi, Masayoshi, 4,488,800, Cl. 354-445.000.

Akashi, Shunji: *See*—
Yoshida, Hiroshi; Matsuda, Yoshio; and Akashi, Shunji, 4,488,337, Cl. 24-381.000.

Akkerman, Neil H., to Akkerman, Neil H. Well tool having a slip assembly. 4,488,595, Cl. 166-206.000.

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Andreasson, Bengt A., 4,488,687, Cl. 242-56.00A.

Aktiebolaget Electrolux: *See*—
Moren, Lars G.; Berg, Ulf P.; and Hedlund, Bengt G., 4,489,262, Cl. 318-700.000.

Aktiebolaget Gyproc: *See*—
Hellsten, Tord M., 4,488,733, Cl. 280-47.160.

Akzona Incorporated: *See*—
Archer, Lee A., 4,488,346, Cl. 29-421.00E.
Battey, Paul K.; and Hope, Peter, 4,488,985, Cl. 252-400.00A.
Ostertag, Karl, 4,488,929, Cl. 156-553.000.

Alberts, Heinrich; Dahm, Manfred; Jabs, Gert; and Wegner, Christian, to Bayer Aktiengesellschaft. Spray drying of microcapsule dispersions. 4,489,017, Cl. 264-4.700.

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Allec, Josiane: *See*—
Grollier, Jean F.; and Allec, Josiane, 4,488,564, Cl. 132-7.000.

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Toker, Nazmi Y., 4,488,590, Cl. 164-423.000.

Allen, William W.: *See*—
Hord, Charles F.; and Allen, William W., 4,488,365, Cl. 38-47.000.

Allied Corporation: *See*—
Bose, Debasis; Datta, Amitava; and DeCristofaro, Nicholas J., 4,489,136, Cl. 428-606.000.
Koford, Stuart K., 4,488,771, Cl. 339-278.00D.
Wong, Franklin S.; and Hildebrand, Clair E., 4,489,041, Cl. 422-186.220.

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Orner, Richard L., Jr.; and Smith, Charles W., 4,489,273, Cl. 324-166.000.
Zajac, Charles J.; and Geiersbach, Allois F., 4,488,382, Cl. 51-165.920.

Allison, Kenneth L.; Gomez, Helio; and Manchego, Robert, to Xerox Corporation. Bitewing holder. 4,489,427, Cl. 378-170.000.

Almond, Stephen W., to Halliburton Company. High temperature stable crosslinked gel fracturing fluid. 4,488,975, Cl. 252-8.55R.

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Alps Electric Co., Ltd.: *See*—
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Alquist, Henry E.: *See*—
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Delassus, Jean; Gey, Michel; Comensoli, Jean-Claude; and Pouger, Paul, 4,489,218, Cl. 174-35.00R.
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Bertaud, Yves; and Leroy, Michel, 4,488,955, Cl. 204-243.00R.

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Neri, Amleto; Capitanio, Lorenzo; and Stefani, Giancarlo, 4,489,204, Cl. 549-248.000.

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Ikeda, Masaki; Amano, Tatsuyuki; and Tokuda, Kazuo, 4,489,344, Cl. 358-22.000.

AMAX Inc.: *See*—
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AMBAC Industries, Incorporated: *See*—
Kimberley, John A.; and Cavanaugh, John B., 4,488,857, Cl. 417-490.000.

Ambal, Gilbert, to ITW de France. Buckling device. 4,488,336, Cl. 24-316.000.

Amendt, Herman M. A.: *See*—
Verhoeven, Johannes M. G.; and Amendt, Herman M. A., 4,489,408, Cl. 369-112.000.

American Cyanamid Company: *See*—
DeVries, Vern G.; and Shepherd, Robert G., 4,489,090, Cl. 424-275.000.
Giglia, Robert D., 4,488,781, Cl. 350-357.000.
Lamb, Glentworth; and Calora, Feliciano B., 4,488,896, Cl. 71-92.000.
Shepherd, Robert G.; and Upeslacis, Janis, 4,489,094, Cl. 424-310.000.
Wright, William B., Jr.; and Press, Jeffrey B., 4,489,089, Cl. 424-273.00R.

American Home Products Corporation: *See*—
Kraft, Thomas L.; Vick, Howard A.; and Meador, James W., 4,488,812, Cl. 356-338.000.

American Hospital Supply Corporation: *See*—
Hawkins, Pamela L.; and Young, Carole J., 4,489,162, Cl. 436-10.000.

AMF Incorporated: *See*—
Hou, Kenneth C., 4,488,969, Cl. 210-679.000.

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Cosmo, Nicola, 4,488,766, Cl. 339-75.0MP.
Sigmon, Ned A., 4,488,768, Cl. 339-99.00R.

Stumpf, Harry M.; and Woratyla, John A., 4,488,581, Cl. 140-147.000.
Anderka, Gerold; Brandt, Joachim; DeBlitz, Gerhard; Martens, Rolf; Paschen, Rolf; Post, Jurgen; and Willimczik, Bernd, to Koh-I-Noor Rapidograph, Inc. Device for exchanging objects in particular writing instruments. 4,489,333, Cl. 346-139.00R.
Andersen, Mark S.: *See*—
Bueters, Kees A.; and Andersen, Mark S., 4,488,516, Cl. 122-379.000.
Andersen, Steen, to Oce-Helioprint AS. Reproduction camera control system. 4,488,805, Cl. 355-69.000.
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Anderson, John A.: *See*—
Preble, John M.; Anderson, John A.; and McGee, Lawrence D., 4,488,856, Cl. 417-409.000.
Andover Monitoring Systems Corporation: *See*—
Brennan, Timothy A., 4,488,822, Cl. 374-101.000.
Andreasson, Bengt A., to Aktiebolaget Amals Mekaniska Verkstad. Method and arrangement for continuously winding-up a web of material. 4,488,687, Cl. 242-56.00A.
Andrews, Bethlehem K.; and Reinhardt, Robert M., to United States of America, Agriculture. Process to produce durable press low formaldehyde release cellulosic textiles. 4,488,878, Cl. 8-187.000.
Angel, Anthony L.; Harris, James L.; and Dube, Michael F., to R. J. Reynolds Tobacco Company. Cold trap. 4,488,887, Cl. 55-269.000.
Angelis, Jurgen: *See*—
Kahlen, Hans; and Angelis, Jurgen, 4,489,258, Cl. 318-317.000.
Antal, Sandor; Smaroglay, Peter; and Lantos, Elemer, to Taurus Gumiipari Vallalat. Process for manufacturing large-length and large-diameter hoses. 4,489,021, Cl. 264-27.000.
Antonov, Alexandr D.: *See*—
Karmyshin, Nikolai V.; Kudryashov, Evgeny I.; Orlov, Vladimir M.; Levashov, Vladimir M.; Khorin, Vladimir N.; and Antonov, Alexandr D., 4,488,757, Cl. 299-32.000.
Antunes, August J.: *See*—
Miller, Dye O.; Antunes, August J.; and Antunes, Jerome, 4,488,480, Cl. 99-386.000.
Antunes, Jerome: *See*—
Miller, Dye O.; Antunes, August J.; and Antunes, Jerome, 4,488,480, Cl. 99-386.000.
Aoki, Takashi: *See*—
Nishikawa, Masao; Hattori, Torao; Aoki, Takashi; and Yoshizawa, Hiroshi, 4,488,446, Cl. 74-330.000.
Aoyagi, Shoji; and Shiraishi, Tetsuo, to Kanzaki Paper Manufacturing Co., Ltd. Pressure sensitive manifold paper. 4,489,336, Cl. 346-209.000.
Arai, Shoji: *See*—
Ogura, Eiji; Mito, Kunihiro; and Arai, Shoji, 4,489,211, Cl. 568-842.000.
Arakawa, Susumu; Tsukigahora, Tooru; and Shirai, Akira, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidoshakogyo Kabushikikaisha. Hydraulic fluid reservoir for automobile. 4,488,404, Cl. 60-535.000.
Archer, Lee A., to Akzona Incorporated. Apparatus for joining pipe. 4,488,346, Cl. 29-421.00E.
Arkansas Patents, Inc.: *See*—
Davis, Robert E., 4,488,865, Cl. 431-1.000.
Arney, Jonathan S.: *See*—
Sanders, Frederick W.; Hillenbrand, Gary F.; Arney, Jonathan S.; and Wright, Richard F., 4,489,151, Cl. 430-138.000.
Arthey, Roger P.: *See*—
Hill, Anthony D.; Ford, David A.; Goulette, Michael J.; and Arthey, Roger P., 4,488,915, Cl. 148-404.000.
ASA S.A.: *See*—
Venot, Jean, 4,488,397, Cl. 57-328.000.
Asami, Motomu: *See*—
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Hutchins, Erle M.; and Schoenemann, William M., Jr., 4,488,355, Cl. 29-882.000.
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Trostyanetsky, David, 4,489,310, Cl. 340-365.0VL.
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Farmer, Paul L., 4,489,356, Cl. 360-97.000.
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Jaulmes, Christian, 4,488,617, Cl. 180-209.000.
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Miller, Richard F.; and Link, John, 4,488,997, Cl. 260-414.000.
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Pulliam, Daniel L.; Evans, John A.; Wilbur, David L.; and Fox, Robert D., 4,489,140, Cl. 428-654.000.
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Aubry, Jacques A.; and Bonfils, Michel R., to Societe' Nationale Industrielle Aerospatial. Vehicle suspension incorporating oscillating arms. 4,488,736, Cl. 280-723.000.
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Auer, Peter; Kluge, Fritz; Lieske, Helmut; and Wutzler, Host, to Dyckerhoff & Widmann Aktiengesellschaft. Method of and apparatus for the manufacture of prefabricated prestressed concrete members. 4,489,024, Cl. 264-71.000.
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Kosmal, Brian A.; and Auld, Frederick W., 4,488,713, Cl. 269-25.000.
Austin, George. Method and fishing tool apparatus for recovering objects from wells. 4,488,747, Cl. 294-86.100.
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Leigh-Monstevens, Keith V., 4,488,701, Cl. 248-637.000.
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Cherry, Charles W., 4,488,326, Cl. 14-72.500.
Awalt, Patrick M. Feeder system employing an adjustable dispenser outlet. 4,488,509, Cl. 119-53.000.
Azuma, Makoto; and Hazue, Masaaki, to Nihon Medi-Physics Co., Ltd. Stable radioactive diagnostic agent and a non-radioactive carrier therefor. 4,489,053, Cl. 424-1.100.
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Petersen, Kurt E.; Squires, Thomas E.; and Shepherd, Charles G., 4,489,015, Cl. 261-92.000.
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Bailey, Roy E.; and Bailey, Ben J. Ratchet wrench. 4,488,459, Cl. 81-58.200.
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Baker, Lewin T.; and Huber, Paul G., to General Electric Company. Clear channel detector for binary digital data transmission system. 4,489,420, Cl. 375-94.000.
Ball, Martin F., to Metal Box Limited. Method and apparatus for sealing a plastics material to a metal substrate. 4,489,018, Cl. 264-25.000.
Ballone, Michael P.; and Meisner, Edward H., to EASCO Corporation. Ergonomic handle for hand tool. 4,488,460, Cl. 81-60.000.
Bang, Judith M. Measuring cup. 4,488,432, Cl. 73-429.000.
Banks, Bernard J.; and Penrose, Alexander B., to Pfizer Inc. Phenyl imidazole derivatives. 4,489,083, Cl. 424-270.000.
Barak, Lawrence S.; Nothnagel, Eugene A.; Webb, Watt W.; and Yocum, Robert R., to Cornell Research Foundation, Inc. Acidic phallotoxin derivatives and methods of preparation. 4,489,001, Cl. 260-112.50R.
Barakitis, Nikolaos; and Cohen, Sheppard, to GTE Products Corporation. Discharge lamp starter and starting and operating circuitry. 4,489,255, Cl. 315-73.000.
Barclay, Donald J.; and Bird, Colin L., to International Business Machines Corporation. Electrolytic display device employing metal ion catalysis. 4,488,782, Cl. 350-357.000.

Bartholomaus, Reiner, to Mannesman Rexroth GmbH. Pressure control valve arrangement. 4,488,574, Cl. 137-487.500.
Barto, John A. Reciprocating thermal actuator. 4,488,403, Cl. 60-530.000.
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Battey, Paul K.; and Hope, Peter, to Akzona Incorporated. Phosphoramidates containing a p-phenylenediamine group. 4,488,985, Cl. 252-400.00A.
Baubles, Richard C., to Jacobson Mfg. Co., Inc. Floating fastener retainer assembly with removable fasteners. 4,488,844, Cl. 411-85.000.
Bauck, Jerald L.; and Daniel, Sam. Electronically scanned space fed antenna system and method of operation thereof. 4,489,325, Cl. 343-374.000.
Bauer, Frederick T.; and Bechtel, Jon H., to Gentex Corporation. Remotely actuated rearview mirror for automotive vehicles. 4,488,777, Cl. 350-279.000.
Bauer, Rainer: *See*—
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Baugh, Benton F.; Henderson, Herman O., Jr.; Fowler, John H.; and Ahlstone, Arthur, to Smith International, Inc. Breech block hanger support. 4,488,740, Cl. 285-84.000.
Bauman, William C.: *See*—
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Baumann, Hans; and Grychtol, Klaus, to BASF Aktiengesellschaft. Azo compound and an azomethine compound and having a tertiary N-dative bond. 4,489,002, Cl. 534-695.000.
Baumann, Heinz; and Baumann, Rembert, to Schaum-Chemie W. Bauer GmbH & Co KG. Method of producing a urea formaldehyde combination foam with a low content of formaldehyde. 4,489,175, Cl. 521-116.000.
Baumann, Otto: *See*—
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Bayer Aktiengesellschaft: *See*—
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Stetter, Jorg; Buchel, Karl H.; Reinecke, Paul; Brandes, Wilhelm; and Frohberger, Paul-Ernst, 4,489,081, Cl. 424-269.000.
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Beachy, Robert W., to General Electric Company. Rechargeable battery with separate charging terminal contact ring. 4,489,268, Cl. 320-2.000.
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Chaoui, Samir M., 4,489,440, Cl. 381-70.000.
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Beaver, Richard N.: *See*—
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Beck, Ernst; and Lenard, Peter, to Vollmer Werke Maschinenfabrik GmbH. Apparatus for advancing a saw blade in a machine for working on saws. 4,488,458, Cl. 76-77.000.
Becker, Rainer; Oeser, Heinz-Gunter; and Acker, Rolf-Dieter, to BASF Aktiengesellschaft. Preparation of 2-(hydroxyphenoxy)-carboxylates. 4,489,207, Cl. 560-61.000.
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Beckwith, Paul B.; Bascle, Kent P.; and Pearce, Jeffrey B., to Harris Corporation. Real time video perspective digital map display. 4,489,389, Cl. 364-522.000.
Becton Dickinson and Company: *See*—
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Beecham Inc.: *See*—
Leung, Yuen P., 4,488,640, Cl. 206-229.000.
Beecher, William J. Binocular and spectacle-type mounting assembly therefor. 4,488,790, Cl. 350-549.000.
Bell & Howell Company: *See*—
Watson, Charles J., 4,488,807, Cl. 355-83.000.
Belokin, Paul. Magnetically mounted shelf divider. 4,488,653, Cl. 211-184.000.
Beltrami, Giovanni; and Formica, Fulvio, to SNAM S.p.A. Method for controlling the heat load of a plant fed with natural gas of variable calorific value and density. 4,488,867, Cl. 431-12.000.
Bemis Manufacturing Company: *See*—
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Eddy, William C., 4,488,400, Cl. 60-274.000.
Steer, John E., 4,489,224, Cl. 200-84.00C.
Bennett, Clarence L., Jr.; and Short, Robert D., III, to Sperry Corporation. Signal harmonic processor. 4,489,280, Cl. 328-139.000.
Bennett, David E.; and Driear, Joseph R., to Kelley Company Inc. Truck locking device. 4,488,325, Cl. 14-71.300.
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Benson, Glendon M., to New Process Industries, Inc. Fluid pressure ratio transformer system. 4,488,853, Cl. 417-240.000.
Berchem, Rutger, to Berchem & Schaberg GmbH. Rotary stone-cutting head with hardened teeth inserts. 4,488,608, Cl. 175-374.000.
Berchem & Schaberg GmbH: *See*—
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Berg, Lloyd; and Yeh, An-I. Separation of m-xylene from o-xylene by extractive distillation. 4,488,937, Cl. 203-51.000.
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Berlincourt, Ted G., to United States of America, Navy. Rotating SQUID magnetometers and gradiometers. 4,489,274, Cl. 324-248.000.
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Bernhardt, Heinrich, to Hoechst Aktiengesellschaft. Process for the reoxidation of dyeings made with sulfur dyestuffs. 4,488,880, Cl. 8-652.000.
Bernhardt, Jost; and Hase, Georg, to Bernhardt Apparatebau GmbH & Co. Release mechanism for retention means for oxygen masks. 4,488,546, Cl. 128-201.230.
Bertaud, Yves; and Leroy, Michel, to Aluminium Pechiney. Sub-cathodic shield with deformable zones for Hall-Heroult electrolysis cells. 4,488,955, Cl. 204-243.00R.
Bertolette Machines, Inc.: *See*—
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Bertolette, Reed: *See*—
Newell, Burtram I.; Bertolette, Reed; and Fogarty, Bruce C., 4,488,423, Cl. 72-385.000.
Bertus, Brent J.; and McKay, Dwight L., to Phillips Petroleum Company. Cracking catalyst. 4,489,169, Cl. 502-64.000.
Betts, Robert E.' Low brisance detonating cord. 4,488,486, Cl. 102-275.100.
Betts, Robert E., to United States of America, Army. Percussion initiated spotting charge. 4,488,490, Cl. 102-513.000.
Bevan, William R.: *See*—
Anderson, Carl R.; Bevan, William R.; Schulein, Robert B.; and Smith, Alan D., 4,489,442, Cl. 381-81.000.
Bevans, William J. Adjustable tool tray. 4,488,497, Cl. 108-144.000.

Beyl, Jean J. A.; Bernard, Jean; Campillo, Christian; Guerreau, Rene ; le Faou, Daniel; and Peyre, Henri, to Ste Look. Ski brake. 4,488,734, Cl. 280-605.000.

Bhagwat, Pradeep M.: *See—*
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Bier, Peter, to Bayer Aktiengesellschaft. Polyethylene terephthalate moulding compositions having high reflectivity. 4,489,110, Cl. 427-250.000.

Bigham, Eric C., to Pfizer Inc. Bis-esters of methanediol with penicillins and penicillanic acid 1,1-dioxide. 4,488,994, Cl. 260-239.100.

Binder, Kurt: *See—*
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Bird, Colin L.: *See—*
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Black, Denny E.; and Garrett, David W., to Owens-Corning Fiberglas Corporation. Size for glass fibers. 4,489,131, Cl. 428-391.000.

Black, Melvin L. Slurry reclamation method. 4,488,815, Cl. 366-8.000.

Block, Charles S.; and Hong, Sun-Nan, to Air Products and Chemicals, Inc. Treatment of wastewater containing phosphorus compounds. 4,488,967, Cl. 210-605.000.

Bloomfield, Philip E.; and Shpuntoff, Harry, to Pennwalt Corporation. Piezoelectric polymeric film occlusal force indicator. 4,488,873, Cl. 433-71.000.

Blume, Alan E. Low sidelobe phased array antenna system. 4,489,324, Cl. 343-372.000.

Blumenthal, Ernesto. Spring balanced door. 4,488,379, Cl. 49-206.000.

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Boberg, Michael: *See—*
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Bock, Gunther; Hafner, Bernhard; Muhl, Reinhold; and Thiel, Klaus P., to International Business Machines Corporation. Reverse process for making chromium masks using silicon dioxide dry etch mask. 4,489,146, Cl. 430-5.000.

Bockholt, Karlheinz H.; and Harris, John F., III, to Western Publishing Company, Inc. Code and reading system. 4,488,679, Cl. 235-469.000.

Boden, Richard M.: *See—*
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Bodytone Limited: *See—*
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Boerner, Georg: *See—*
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Boliden Aktiebolag: *See—*
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Bolsing, Friedrich. Process for even division of substances and mixtures of substances in the course of manufacture of pulverulent preparations by chemical reaction. 4,488,971, Cl. 210-751.000.

Bolza-Schunemann, Hans-Bernhard, to Koenig & Bauer Aktiengesellschaft. Simplified inking unit. 4,488,485, Cl. 101-350.000.

Bomatic, Inc.: *See—*
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Bond, George L., to International Business Machines Corporation. Fault alignment control system and circuits. 4,489,403, Cl. 365-200.000.

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Borg, Arthur N., to Zenith Electronics Corporation. Microprocessor power on reset system. 4,489,394, Cl. 364-900.000.

Borgonovi, Giancarlo, to Science Applications, Inc. Means and method for determining residual stress on a polycrystalline sample by X-ray diffraction. 4,489,425, Cl. 378-72.000.

Borrelli, Nicholas F.; Elmer, Thomas H.; Morse, David L.; and Sachenik, Paul A., to Corning Glass Works. Integral optical device and method of making it. 4,488,864, Cl. 430-13.000.

Bose, Debasis; Datta, Amitava; and DeCristofaro, Nicholas J., to Allied Corporation. Homogeneous low melting point copper based alloys. 4,489,136, Cl. 428-606.000.

Bottum, Edward. Suction accumulator structure. 4,488,413, Cl. 62-503.000.

Bouko, Jean: *See—*
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Bouscher, Lawrence E.: *See—*
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Bovenizer, Patrick J.: *See—*
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Bowerman, Paul D.; Clapper, Thomas W.; and Laughlin, William C., to Kerr-McGee Chemical Corporation. Improvements in the manufacture of manganous sulfate solutions. 4,489,043, Cl. 423-49.000.

Bowers, Kenneth R., Jr.: *See—*
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Bowes, David: *See—*
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Boyer, Nicodemus E., to PPG Industries, Inc. Alkanediyl bromo-substituted arylenediyl carbonate polymers. 4,489,189, Cl. 524-409.000.

Boyle, Bede A. Feedstock injection system for fluidized bed combustor. 4,488,512, Cl. 122-4.00D.

Boyles, Edward K. Hold down latch apparatus. 4,488,371, Cl. 42-90.000.

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Brand, Wilhelm; Hersing, Hans; and Baasner, Dietmar, to Hermann Berstorff Maschinenbau GmbH. Method and apparatus for cutting open-flanked or open-sided V-belts. 4,488,465, Cl. 83-175.000.

Brandes, Wilhelm: *See—*
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Brandt, Joachim: *See—*
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Brandt, Ulrich; and Gray, Anthony J., to MacTaggart Scott & Co., Ltd. Aircraft handling systems. 4,488,693, Cl. 244-116.000.

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Bray, Richard L.: *See—*
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Breddan, Joseph A., to AT&T Bell Laboratories. Device control system. 4,489,386, Cl. 364-493.000.

Brennan, Michael E.; and Speranza, George P., to Texaco Inc. Mannich condensates having fire retardancy properties and manufacture of rigid polyurethane foam therewith. 4,489,178, Cl. 521-167.000.

Brennan, Timothy A., to Andover Monitoring Systems Corporation. Time/temperature indicator. 4,488,822, Cl. 374-101.000.

Bridgeford, Douglas J., to Teepak, Inc. Arabinogalactans as release additives for cellulose containing casings. 4,489,114, Cl. 428-36.000.

Bridgestone Tire Company Limited: *See—*
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British Aerospace Public Limited Company: *See—*
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Brixner, Lothar H., to Du Pont de Nemours, E. I., and Company. Preparation of lanthanum bismuth oxychloride phosphors. 4,488,983, Cl. 252-301.40H.

Brock, Robert H., Jr.: *See—*
Zulch, Donald I.; and Brock, Robert H., Jr., 4,489,322, Cl. 343-17.700.

Brockie, Raymond V.: *See—*
Rooke, Robert J.; Skierski, James E.; and Brockie, Raymond V., 4,488,464, Cl. 83-99.000.

Brodsky, Stephen L., to Everest & Jennings, Inc. Primary and secondary dynamic braking system. 4,489,256, Cl. 318-87.000.

Brooks, Alden W., to Dayco Corporation. Method of making a top toothed endless power transmission belt construction. 4,489,030, Cl. 264-293.000.

Brorson, John-Erik B.: *See—*
Larsson, Peter L.; and Brorson, John-Erik B., 4,488,583, Cl. 141-311.00R.

Brother Kogyo Kabushiki Kaisha: *See—*
Yoshimura, Motokazo; Takiguchi, Michitaka; Horie, Fujio; and Hirata, Koichi, 4,489,436, Cl. 381-51.000.

Broussard, Alphe. Expandable mobile trailer. 4,488,752, Cl. 296-171.000.

Brown, Anthony D.; and Cerrato, Vincent J., to Grundy Dispense Systems, Inc. Apparatus for retaining a valve body in engagement with the valve neck of a pressurized container. 4,488,572, Cl. 137-315.000.

Brown, Boveri & Cie, AG: *See—*
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Brown, David; Hargreaves, Rodney B.; McLoughlin, Bernard J.; and Mills, Stuart D., to Imperial Chemical Industries, PLC. 1,3,4-Thiadiazin-2-ones. 4,489,074, Cl. 424-246.000.

Brown, Geoffrey D.: *See—*
Keogh, Michael J.; Wallace, Scott L.; and Brown, Geoffrey D., 4,489,029, Cl. 264-174.000.

Brown, Peter L.; Fitzpatrick, Patrick C.; and Lloyd, Frederick W., to Bodytone Limited. Collapsible exercising apparatus. 4,488,719, Cl. 272-72.000.

Brown, Ralph W., II: *See—*
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Brown, William A. Apparatus for machining workpieces to a predetermined shape. 4,488,841, Cl. 409-292.000.

Brummer, S. Barry: *See—*
Abraham, Kuzhikalail M.; Brummer, S. Barry; and Foos, Joseph S., 4,489,145, Cl. 429-197.000.

Brunswick Corporation: *See—*
Councilman, Richard R., 4,488,689, Cl. 242-84.50A.
Schaeffer, John I., 4,488,966, Cl. 210-485.000.

Brunton, Bruce A. Concealed recessed urinal. 4,488,321, Cl. 4-301.000.

Brusa, Michel: *See—*
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Bubeck, Friedrich; and Reimpell, Uwe, to Leybold-Heraeus GmbH. Clamp for joining together a pair of flanges. 4,488,744, Cl. 285-408.000.

Buchel, Karl H.: *See—*
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Stetter, Jorg; Buchel, Karl H.; Reinecke, Paul; Brandes, Wilhelm; and Frohberger, Paul-Ernst, 4,489,081, Cl. 424-269.000.

Buchtal GmbH: *See—*
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Buckley, John D.: *See—*
Fox, Robert L.; Frizzill, Alan W.; Little, Bruce D.; Progar, Donald J.; Coultrip, Robert H.; Couch, Richard H.; Gleason, John R.; Stein, Bland A.; Buckley, John D.; and St. Clair, Terry L., 4,488,335, Cl. 24-304.000.

Budd Company, The: *See—*
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Epel, Joseph N.; and Wilkinson, Robert E., 4,488,862, Cl. 425-405.00R.

Budzich, Tadeusz, to Caterpillar Tractor Co. Fully compensated fluid control valve. 4,488,474, Cl. 91-446.000.

Buell, Erik F., to Harley-Davidson Motor Co., Inc. Wheel disc brake. 4,488,761, Cl. 301-6.00E.

Bueters, Kees A.; and Andersen, Mark S., to Combustion Engineering, Inc. Soot blower system. 4,488,516, Cl. 122-379.000.

Bujadoux, Karel, to CdF Chimie S.A. Societe Chimique des Charbonnages. Polymerization of ethylene with a catalyst comprising several transition metal compounds. 4,489,198, Cl. 526-114.000.

Burde, Carl M.: *See—*
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Burger, Erich, to Siemens Aktiengesellschaft. Digital message transmission system employing pulse stuffing and having two plesiochronic sampling clocks. 4,489,421, Cl. 375-112.000.

Burkes, Marc. Ski/pole carrier apparatus. 4,488,748, Cl. 294-147.000.

Burroughs Corporation: *See—*
Daberkoe, David P., 4,489,365, Cl. 361-403.000.
Hsieh, Der-Chang; and LaBudde, Edward V., 4,489,406, Cl. 369-32.000.
Lee, Kin H., 4,489,397, Cl. 364-900.000.

Buschow, Kurt H. J.: *See—*
van Essen, Roelof M.; and Buschow, Kurt H. J., 4,489,050, Cl. 423-644.000.

Butel, Jean: *See—*
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Butler, Donald R., to Stained Glass Overlay, Inc. Method for making simulated beveled and leaded glass window structure. 4,488,919, Cl. 156-153.000.

Butler, James R.; Kendall, Debra L.; Forward, Cleve H.; Watson, James M.; and Branuft, Gary D., to Cosden Technology, Inc. Production of ortho-suppressed dialkyl benzenes. 4,489,214, Cl. 585-467.000.

Butterworth, Arthur L.; Tischer, James C.; and Utter, Robert E., to Trane Company, The. Main bearing lubrication system for scroll machine. 4,488,855, Cl. 417-368.000.

Byrnes, Thomas E.: *See—*
von Gnechten, Lawrence A.; Byrnes, Thomas E.; and Lasky, John C., 4,488,675, Cl. 229-33.000.

C.E.M. Co., Inc.: *See—*
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Cabot Corporation: *See—*
Asphahani, Aziz I.; Kelley, Eugene W.; and Kolts, Juri, 4,489,040, Cl. 420-584.000.

Callahan, Lynn T., III: *See—*
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Campbell, Roy: *See—*
Price, Anthony G.; and Campbell, Roy, 4,488,405, Cl. 60-581.000.

Campbell, Simon F.; Roberts, David A.; and Stubbs, John K., to Pfizer Inc. Cyclic sulfonamidoalkyl substituted 4-piperidinoquinazoline cardiac stimulants. 4,489,075, Cl. 424-246.000.

Campillo, Christian: *See—*
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Canadian Marconi Company: *See—*
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Itani, Takashi; Kozuki, Susumu; and Narasawa, Takashi, 4,489,345, Cl. 358-29.000.
Iura, Yukio; Shimizu, Masami; Aizawa, Hiroshi; Tsunekawa, Tokuichi; Uchidoi, Masanori; and Yamamichi, Masayoshi, 4,488,800, Cl. 354-445.000.
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Capitanio, Lorenzo: *See—*
Neri, Amleto; Capitanio, Lorenzo; and Stefani, Giancarlo, 4,489,204, Cl. 549-248.000.

Caramel, Rudolf, to VDO Adolf Schindling AG. Electro-optical display element for preventing specular reflection of incident light. 4,488,786, Cl. 350-337.000.

Carey, Richard A.; and Falk, Jerry, to Honeywell Information Systems Inc. Write protected memory. 4,489,380, Cl. 364-200.000.

Cargill, Incorporated: *See—*
Williams, Joy L.; Rose, David L.; and Haas, Louis M., 4,488,958, Cl. 209-2.000.

Carminati, Paolo: *See—*
Giudice, Antonina; Moulineau, Claude; Manara, Luciano; and Carminati, Paolo, 4,489,079, Cl. 424-260.000.

Carraway, Richard E.: *See—*
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Casio Computer Co., Ltd.: *See—*
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Cassella Aktiengesellschaft: *See—*
Keil, Karl-Heinz; Greiner, Ulrich; Eckardt, Georg-Wolfgang; and Kohler, Volker, 4,488,974, Cl. 252-8.800.

Castonguay, Roger N.; McCuin, Jon P.; and Powell, David B., to General Electric Company. Electric switchboard apparatus with a breaker-fuse interlock. 4,489,362, Cl. 361-339.000.

Caterpillar Tractor Co.: *See—*
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Moore, Michael E.; and Papasideris, Stamos I., 4,488,449, Cl. 74-501.00R.

Cattaneo, Filippo: *See—*
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Cava, Michael P.; and Dominguez, Domingo, to Adria Laboratories, Inc. Synthesis of (+)-4-demethoxydaunomycinone. 4,489,206, Cl. 549-543.000.

Cavagnero, Erman V.; English, George A.; and Marracino, Charles R., to Clevepak Corporation. Motor bearing and seal assembly. 4,488,825, Cl. 384-152.000.

Cavanaugh, John B.: *See—*
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Caveney, Jack E.; and Moody, Roy A., to Panduit Corp. Termination tooling for applying connectors to flat cable. 4,488,353, Cl. 29-749.000.

CdF Chimie S.A. Societe Chimique des Charbonnages: *See—*
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Celanese Corporation: *See—*
Froix, Michael F., 4,489,190, Cl. 524-539.000.
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Ceres Electronics Corporation: *See—*
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Cessna Aircraft Company, The: *See—*
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Chadwick, Dennis P., to Urban Transportation Development Corporation Ltd. Jacking device for articulated streetcar. 4,488,709, Cl. 254-423.000.

Chan, Ho C.: *See—*
Tseung, Alfred C. C.; Chan, Ho C.; Fouzder, Nani B.; and Sriskandarajah, Thurairajah, 4,488,578, Cl. 138-146.000.

Chan, Kasun K.; Erickson, Gerald J.; Schuck, David B.; and Stone, James W., to NCR Corporation. Method for simulating and testing an integrated circuit chip. 4,488,354, Cl. 29-830.000.

Chance, Dudley A.; Platt, Alan; Ho, Chung W.; and Ray, Sudipta K., to International Business Machines Corporation. Chip carrier with embedded engineering change lines with severable periodically spaced bridging connectors on the chip supporting surface. 4,489,364, Cl. 361-395.000.

Chang, Mike S. H. Organic photoconductive elements employing a polycarbonate resin. 4,489,147, Cl. 430-58.000.

Chang, Shaw-Ping; and Shieh, Paul, to Ricoh Company, Ltd. Electrophotographic polyester toner blends. 4,489,150, Cl. 430-106.000.

Chang, Tzu-Ching, to Du Pont de Nemours, E. I., and Company. Separation of amines by preferential aqueous salt extraction. 4,489,209, Cl. 564-425.000.

Changani, Pushpkumar D.; Peacock, Donald G.; and Roberts, David, to Raychem Limited. Polymeric articles. 4,488,642, Cl. 206-345.000.

Chaoui, Samir M., to Bear Medical Systems, Inc. Pressure-compensated pneumatic speech simulator. 4,489,440, Cl. 381-70.000.

Chaplin, George B. B., to Sound Attenuators Limited. Method and apparatus for cancelling vibration. 4,489,441, Cl. 381-71.000.

Charpentier, Albert J.; and Redfield, James W. Operational amplifier circuit for NMOS chip. 4,489,284, Cl. 330-277.000.

Cheng, Lap K., to Hang Tjuk Industrial Col Ltd. Toy vehicle with pivotable body. 4,488,375, Cl. 446-443.000.

Cherdron, Philip: *See—*
Ligensa, Karl-Heinz G.; and Cherdron, Philip, 4,488,451, Cl. 74-553.000.
Cherry, Charles W., to Autoquip Corporation. Pallet dock lift. 4,488,326, Cl. 14-72.500.
Chevalier, Claude, to Compagnie Industrielle de Mecanismes, en abrege C.I.M. Device for regulating the position of an element and in particular a vehicle seat structure. 4,488,699, Cl. 248-396.000.
Chevron Research Company: *See—*
Duerksen, John H., 4,488,598, Cl. 166-252.000.
Gibson, Kirk R., 4,489,173, Cl. 502-313.000.
Chi, Chang V.; and Baker, Bernard S., to Energy Research Corporation. Fuel cell cooling assembly. 4,489,142, Cl. 429-26.000.
Chiel, David, to Metal Works Ramat David. Self-propelled irrigation equipment. 4,488,683, Cl. 239-199.000.
Christman, Jon D.: *See—*
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Chu, Nan S., to Union Carbide Corporation. Preparation of a glutaraldehyde precursor. 4,489,205, Cl. 549-417.000.
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Chung, Rack H., deceased (by Chung, Betsy A., executrix), to General Electric Company. Silane scavengers for hydroxy radicals containing silicon-hydrogen bonds. 4,489,191, Cl. 524-779.000.
Ciba-Geigy AG: *See—*
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Fory, Werner; Martin, Henry; and Pissiotas, Georg, 4,488,899, Cl. 71-105.000.
Fory, Werner; Martin, Henry; and Pissiotas, Georg, 4,488,900, Cl. 71-105.000.
Cioca, Gheorghe, to Seton Company. Method of fining alcoholic beverages. 4,489,100, Cl. 426-422.000.
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Claassen, George B.; Karlo, Rudolph A.; and Zimmerman, William B., to PPG Industries, Inc. Movable alignment stops for glass sheet shaping apparatus. 4,488,893, Cl. 65-287.000.
Claassen, George R.: *See—*
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Clark, Joseph H. Diesel fuel monitor system, negative pressure type. 4,488,970, Cl. 210-746.000.
Clark, Milton B., to Union Carbide Corporation. Isoxazole derivative additive in organic electrolytes of nonaqueous cells employing solid cathodes. 4,489,144, Cl. 429-196.000.
Clark, William H. Flip cube puzzle. 4,488,725, Cl. 273-153.00S.
Claunch, Charles K.; and Bowes, David, to Finish Engineering Company, Inc. Small solvent recovery unit. 4,488,933, Cl. 202-83.000.
Claypool, Mark P., to Powers Manufacturing, Inc. Flaw detector. 4,488,648, Cl. 209-526.000.
Cleland, Robert K. Beverage dispensing machine. 4,488,664, Cl. 222-56.000.
Clemmow, Raymond J.; Radford, Leonard; and Thorpe, John D., to Padley & Venables Limited. Pick and the combination of a pick and holder. 4,488,758, Cl. 299-81.000.
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von Recum, Andreas F., 4,488,319, Cl. 3-1.913.
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Cocks, Eric H.; and Griffin, Richard A., to Spraymation, Inc. Multiple-outlet adhesive applicator apparatus and method. 4,488,665, Cl. 222-146.500.
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Cohen, Sheppard: *See—*
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Colburn, Harry E. Bed sheets with hook and loop fasteners. 4,488,323, Cl. 5-460.000.
Coleman, Kelly R. Sign with perimeter flange for universal mounting. 4,488,368, Cl. 40-564.000.
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Takamura, Takatsugu, 4,488,560, Cl. 128-738.000.
Colson, James G.: *See—*
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Colvin, Roger D.: *See—*
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Combustion Engineering, Inc.: *See—*
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Comeau, Perry J. Apparatus for supporting the arm of a patient on an operating table. 4,488,715, Cl. 269-328.000.
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Commonwealth of Puerto Rico: *See—*
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Conair Corporation: *See—*
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Conley, Richard W.; and Tremblay, Richard P., to Kerotest Manufacturing Corp. Compression coupling for service valve. 4,488,741, Cl. 285-250.000.
Connelly, Robert W. Pacifier with flow regulating means. 4,488,551, Cl. 128-360.000.
Conoco Inc.: *See—*
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Continental Group, Inc., The: *See—*
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Cook, Eugene F. Foldable game board with rotatable display disk. 4,488,720, Cl. 273-239.000.
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Coquio, Claude: *See—*
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Cornell Research Foundation, Inc.: *See—*
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Cosden Technology, Inc.: *See—*
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Cosentino, Louis C.: *See—*
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Cosmo, Nicola, to AMP Incorporated. High density zero insertion force connector. 4,488,766, Cl. 339-75.0MP.
Costales, Mark J.: *See—*
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Cottrell, Thomas A. Method and apparatus for extracting aloe vera gel. 4,488,482, Cl. 100-37.000.
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Councilman, Richard R., to Brunswick Corporation. Method of assembling a drag cartridge in a rear mounted drag reel. 4,488,689, Cl. 242-84.50A.
Cour, Francis R. Method and apparatus for embedding a pipe in a trench in weak ground. 4,488,836, Cl. 405-159.000.
Courson, Iber C., to Westinghouse Electric Corp. Balustrade. 4,488,631, Cl. 198-335.000.
Couvreur, Patrick; Roland, Michel; and Speiser, Peter, to N.V. Sopar S.A. Process for preparing biodegradable submicroscopic particles containing a biologically active substance and their use. 4,489,055, Cl. 424-7.100.

Craig, Alan J.; and Look, Thomas F., to Minnesota Mining and Manufacturing Company. Servo motor controlled labeler. 4,488,925, Cl. 156-351.000.

Crawford, John S.: *See—*
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Cremer, Gottfried, to Buchtal GmbH. Process for producing uneven coloring effects on firing plate-like ceramic material. 4,488,871, Cl. 432-19.000.

Criblez, Roger; and Schoenenberger, Raymond, to Hatebur Umformmaschinen AG. Process and appliance for feeding material to hot and semi-cold metal-working machines. 4,488,420, Cl. 72-128.000.

Critikon, Inc.: *See—*
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Croizer, Pierre C., to MATRA. Stepped body penetration bomb. 4,488,487, Cl. 102-382.000.

Crosfield Data Systems: *See—*
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Sheck, Wah, 4,488,717, Cl. 271-3.000.

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Culver, Larry J.: *See—*
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Cuscurida, Michael; and Gipson, Robert M., to Texaco Development Corp. Low foaming nonionic polyether polycarbonate surfactants and functional fluids. 4,488,982, Cl. 252-174.210.

D. Mulock-Bentley and Associates (Proprietary) Limited: *See—*
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Daberkoe, David P., to Burroughs Corporation. Universal leadless chip carrier mounting pad. 4,489,365, Cl. 361-403.000.

Dabney, Richard W., to United States of America, National Aeronautics and Space Administration. Power Control for AC motor. 4,489,264, Cl. 318-729.000.

Dahm, Manfred: *See—*
Alberts, Heinrich; Dahm, Manfred; Jabs, Gert; and Wegner, Christian, 4,489,017, Cl. 264-4.700.

Dai Nippon Insatsu Kabushiki Kaisha: *See—*
Kato, Yasuo, 4,488,808, Cl. 356-73.000.

Daimler-Benz AG: *See—*
Kling, Gunter, 4,488,751, Cl. 296-146.000.

Daimler-Benz Aktiengesellschaft: *See—*
Wohlfarth, Peter, 4,488,518, Cl. 123-41.490.

Dainippon Screen Manifacturing Co., Ltd.: *See—*
Nishihama, Takamichi; and Otsuji, Masahiko, 4,488,803, Cl. 355-28.000.

Dainippon Screen Seizo Kabushiki Kaisha: *See—*
Takagi, Tsuneo, 4,488,804, Cl. 355-56.000.

d'Alayer de Costemore d'Arc, Stephane M., to Staar S. A. Electronic still camera with individual non-volatile memory units. 4,489,351, Cl. 358-213.000.

Dalman, Lew. Apparatus for elevating a truck body. 4,488,756, Cl. 298-19.00B.

Dang, Hiep D.: *See—*
Morris, Gregory J. E.; Beaver, Richard N.; Grosshandler, Sandor; Dang, Hiep D.; and Pimlott, John R., 4,488,946, Cl. 204-98.000.

Daniel, Sam: *See—*
Bauck, Jerald L.; and Daniel, Sam, 4,489,325, Cl. 343-374.000.

Daniels, John R.: *See—*
Luck, Edward E.; and Daniels, John R., 4,488,911, Cl. 106-161.000.

Danis, Louis J., to Williams International Corporation. Process of making a ceramic heat exchanger element. 4,488,920, Cl. 156-155.000.

Dann, Bert H., to Eastman Kodak Company. Information recording system with recording process monitoring function. 4,489,354, Cl. 360-64.000.

Dart Industries Inc.: *See—*
Swett, James B.; and Herlow, Erik, 4,488,667, Cl. 222-485.000.

Data-Pac Mailing Systems Corp.: *See—*
Yankloski, Richard A., 4,488,610, Cl. 177-4.000.

Datta, Amitava: *See—*
Bose, Debasis; Datta, Amitava; and DeCristofaro, Nicholas J., 4,489,136, Cl. 428-606.000.

Daugirda, Paul G., to Rheem Manufacturing Company. Vessel construction employing multiple internal heat exchange tubes. 4,488,342, Cl. 29-157.30R.

Dausinger, Friedrich; Muller, Werner; von Roda, Eckart; Reibetanz, Wilbert; and Baumann, Otto. Method of embedding hard cutting particles in a surface of a cutting edge of cutting tools, particularly saw blades, drills and the like. 4,488,882, Cl. 51-295.000.

Davis, John S., to Paramount Packaging Corporation. Flexible package with easy opening peel seal. 4,488,647, Cl. 206-525.000.

Davis, Robert E., to Arkansas Patents, Inc. Pulsing combustion. 4,488,865, Cl. 431-1.000.

Davis, William R.; and Hart, David G., to Fairchild Weston Systems, Inc. Light weight chassis and cabinet assembly for magnetic tape recorder. 4,489,358, Cl. 360-137.000.

Davison, Sol, to Shell Oil Company. Thermoforming process using modified polymer blend. 4,489,034, Cl. 264-331.150.

Dawson, Daniel J.: *See—*
Wang, Patricia C.; and Dawson, Daniel J., 4,489,197, Cl. 525-328.200.

Dawsonville Corporation N.V.: *See—*
Niemeijer, Halbe J., 4,488,550, Cl. 128-316.000.

Dayco Corporation: *See—*
Brooks, Alden W., 4,489,030, Cl. 264-293.000.

Dean, Walter C., II, to Budd Company, The. Soft primar suspension system for a railway car. 4,488,495, Cl. 105-224.100.

DeBlitz, Gerhard: *See—*
Anderka, Gerold; Brandt, Joschim; DeBlitz, Gerhard; Martens, Rolf; Paschen, Rolf; Post, Jurgen; and Willimczik, Bernd, 4,489,333, Cl. 346-139.00R.

De Coene, Frans J. G. C., to Sperry Corporation. Feeder mechanism for agricultural baler. 4,488,636, Cl. 198-608.000.

DeCristofaro, Nicholas J.: *See—*
Bose, Debasis; Datta, Amitava; and DeCristofaro, Nicholas J., 4,489,136, Cl. 428-606.000.

Deere & Company: *See—*
Hoffa, Robert J.; and Burde, Carl M., 4,489,321, Cl. 343-8.000.
Lang, Stephen P.; Martin, Yolanda E.; Pinkston, Patrick E.; and Rao, Kanaparty N., 4,489,305, Cl. 340-57.000.
Lang, Stephen P.; Martin, Yolanda E.; and Norton, Richard G., 4,489,311, Cl. 340-501.000.

Degen, Ludwig: *See—*
Olivieri, Roberto; Eletti Bianchi, Giancarlo; Fascetti, Eugenio; Centini, Felice; Degen, Ludwig; and Marconi, Walter, 4,489,208, Cl. 562-470.000.

DeGroot, Gerrit; and Slag, Alexander H., to Hollandse Signaalapparaten B.V. Plot generator. 4,489,388, Cl. 364-517.000.

de Jong, Willem A.; and van der Linde, Berend J., to Nederlandse Centrale Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek. Process for removing hydrogen sulphide from process gases using solid acceptors, process for cyclic regenerating the used acceptors at high temperature, as well as process for preparing acceptors, which are suitable for this process. 4,489,047, Cl. 423-230.000.

Delafield, Fredrick B. Connection joint for article of furniture. 4,488,698, Cl. 248-188.000.

Deland, Francois. Water cooler bottle closure. 4,488,657, Cl. 215-303.000.

Delaney, Richard D. Ski glove. 4,488,313, Cl. 2-17.000.

de Lange, Tinus, to Wavin B.V. Insulating pipe part. 4,488,739, Cl. 285-55.000.

Delano, Mark A., to Union Carbide Corporation. Process for making slush. 4,488,407, Cl. 62-74.000.

Delassus, Jean; Gey, Michel; Comensoli, Jean-Claude; and Pouger, Paul, to Alsthom-Atlantique. Device for protecting metal objects situated in the environment of an intense magnetic field developed by an alternator rotor without a stator. 4,489,218, Cl. 174-35.00R.

del Ser Gonzalez, Clemente. Bottle-sealing machine. 4,488,394, Cl. 53-585.000.

Demello, Xavier J.; and Pennington, Deborah K. Musical instrument holder. 4,488,469, Cl. 84-385.00A.

Denisov, Petr I.: *See—*
Trubitsin, Alexandr V.; Polyakov, Mikhail G.; Fomin, Georgy M.; Denisov, Petr I.; Petrov, Pavel E.; and Pomelnikov, Petr P., 4,488,688, Cl. 242-78.000.

Denton, Robert A.; and Morgan, Craig R., to Robert A. Denton, Inc. Crash test dummy lower leg structure. 4,488,433, Cl. 73-432.00R.

de Poray, Marcel C. K.; and Kissel, Roland. Solid fuel boiler of the radiating furnace tube type, method for converting a boiler and means for carrying out said method. 4,488,514, Cl. 122-149.000.

Derkach, Donald J.: *See—*
Paradise, Joseph P.; and Derkach, Donald J., 4,489,422, Cl. 377-28.000.

Deschepper, Pierre: *See—*
Robyn, Pierre; and Deschepper, Pierre, 4,489,022, Cl. 264-30.000.

DeSoto, Inc.: *See—*
Tortorello, Anthony J., 4,489,179, Cl. 523-420.000.

Deutsch, Edward A.; and Glavan, Kenneth A., to Research Corporation. Cationic lipophilic complexes of ^{99m}Tc and their use for myocardial and hepatobiliary imaging. 4,489,054, Cl. 424-1.100.

Deutsch, Richard A., to Adjustable Bushing Corp. Nose member for an expandible bushing type locking assembly. 4,488,842, Cl. 411-33.000.

De Vries, Donald H.; Reifschneider, Walter; and Costales, Mark J., to Dow Chemical Company, The. Method and composition for enhancing the insecticidal activity of certain organophosphorus compounds. 4,489,068, Cl. 424-200.000.

DeVries, Vern G.; and Shepherd, Robert G., to American Cyanamid Company. Dibenzocycloalkanamido and dibenzothioxanthenyl benzoic acids. 4,489,090, Cl. 424-275.000.

Dhein, Rolf: *See—*
Hocker, Jurgen; Dhein, Rolf; and Merten, Rudolf, 4,488,987, Cl. 252-520.000.

Diamond Automations, Inc.: *See—*
Loeffler, Thomas V., 4,488,637, Cl. 198-653.000.

Diamond, Julius: *See—*
Douglas, George H.; and Diamond, Julius, 4,488,993, Cl. 260-239.00A.

Diamond Shamrock Chemicals Company: *See—*
Fenn, Robert W., III; Pless, Emory J.; Harris, Richard L.; and O'Leary, Kevin J., 4,489,025, Cl. 264-104.000.

Dibiasi, Daniel J., to Mobil Oil Corporation. Method of forming cross-linked styrenic polymer articles and the articles. 4,489,020, Cl. 264-26.000.

Diel, Robert M.; and Putnam, Richard C., to Cessna Aircraft Company, The. Marker control valve. 4,488,476, Cl. 91-513.000.

Diesel Kiki Co., Ltd.: *See—*
Hara, Toshizo, 4,488,409, Cl. 62-127.000.

Dilgren, Richard E.; and Owens, Kenneth B., to Shell Oil Company. Olefin sulfonate-improved steam foam drive. 4,488,976, Cl. 252-8.55D.

Diller, Calvin D., to Tektronix, Inc. Compensation of a high voltage attenuator. 4,489,270, Cl. 323-354.000.

Dillon, Jerry J.: *See*—
Shaheen, Frank G.; and Dillon, Jerry J., 4,489,099, Cl. 426-3.000.

dinh Can, Tran. Method for packaging sterile acupuncture needles. 4,488,393, Cl. 53-450.000.

Disko, Harry: *See*—
Glickson, David A.; and Disko, Harry, 4,488,373, Cl. 446-4.000.

Ditgens, Klaus: *See*—
Stetter, Jorg; Ditgens, Klaus; Thomas, Rudolf; Eue, Ludwig; and Schmidt, Robert R., 4,488,895, Cl. 71-90.000.

Dixon, Jerry D.; Marazas, Gerald A.; McNeill, Andrew B.; and Merckel, Gerald U., to International Business Machines Corporation. Automatic adjustment of the quantity of prefetch data in a disk cache operation. 4,489,378, Cl. 364-200.000.

Dobberstein, Robert J.: *See*—
Grass, Joseph J.; and Dobberstein, Robert J., 4,489,426, Cl. 378-150.000.

Dr. H. Schmittmann GmbH: *See*—
Schmittmann, Hans-Bernd; and Muller, Samuel, 4,488,603, Cl. 169-24.000.

Dolgow, Joanne; and Riddle, David, to Dolgow, Joanne. Photographic apparatus for making simultaneous exposures. 4,488,794, Cl. 354-83.000.

Dombay, Zsolt: *See*—
Farkas, Tibor; Horvath, Ibolya; Horvath, Laszlo L; Vigh, Laszlo; Dombay, Zsolt; Nagy, Jozsef; Nagy nee Gera, Emilia; Pavlicsak, Csaba; and Tarpai, Gyula, 4,488,901, Cl. 71-121.000.

Dominguez, Domingo: *See*—
Cava, Michael P.; and Dominguez, Domingo, 4,489,206, Cl. 549-543.000.

Doring, John D., to Meditronic, Inc. Pacing lead with insertable memory coil. 4,488,561, Cl. 128-786.000.

Dorman, Richard: *See*—
Kissinger, Curtis; and Dorman, Richard, 4,488,813, Cl. 356-375.000.

Dougherty, Robert C., to Durodyne, Inc. Method for fabricating long length hose utilizing an internal moving mandrel. 4,488,921, Cl. 156-172.000.

Douglas, George H.; and Diamond, Julius, to William H. Rorer, Inc. Amidinoureas. 4,488,993, Cl. 260-239.00A.

Dow Chemical Company, The: *See*—
De Vries, Donald H.; Reifschneider, Walter; and Costales, Mark J., 4,489,068, Cl. 424-200.000.
Hefner, Robert E., Jr., 4,489,202, Cl. 528-95.000.
Larson, Eric H.; Kurtz, Bruce E.; and Fitch, Robert H., 4,488,948, Cl. 204-98.000.
Lay, George E.; Haigh, Daniel H.; and Knipstein, Richard A., 4,489,058, Cl. 424-78.000.
Lee, John M.; and Bauman, William C., 4,488,949, Cl. 521-28.000.
Morris, Gregory J. E.; Beaver, Richard N.; Grosshandler, Sandor; Dang, Hiep D.; and Pimlott, John R., 4,488,946, Cl. 204-98.000.
Relenyi, Attila G.; and Paul, George A., 4,489,098, Cl. 424-333.000.
Stutts, Kenneth J.; and Snoble, Karel A. J., 4,488,944, Cl. 204-79.000.
Wilson, David A.; and Crump, Druce K., 4,489,203, Cl. 544-337.000.

Dow Corning Corporation: *See*—
Gutek, Beth I.; and Van Wert, Bernard, 4,489,127, Cl. 428-266.000.

Doyle, Edward J., to Conair Corporation. Table top air filter. 4,488,888, Cl. 55-481.000.

Draber, Wilfried; Buchel, Karl H.; Plempel, Manfred; and Haller, Ingo, to Bayer Aktiengesellschaft. Antimicrobial agents and their use employing imidazolyl-enal ethers. 4,489,085, Cl. 424-273.00R.

Drexler, Hermann-Josef; Ebner, Franz; Hille, Hans-Dieter; and Roth, Ulrich, to BASF Farben & Fasern AG. Water-dilutable coating agent for preparing the base layer of a multilayer coating. 4,489,135, Cl. 428-423.100.

Driear, Joseph R.: *See*—
Bennett, David E.; and Driear, Joseph R., 4,488,325, Cl. 14-71.300.

DrM, Dr. Muller AG: *See*—
Muller, Hans; and Schumacher, Ivo, 4,488,965, Cl. 210-232.000.

Drugeon, Jean-Francois; and Badersbach, Jean. Bicycle pedal for coupling a shoe in preset position, and a cyclist's shoe fitted to said pedal. 4,488,453, Cl. 74-594.600.

Dube, Michael F.: *See*—
Angel, Anthony L.; Harris, James L.; and Dube, Michael F., 4,488,887, Cl. 55-269.000.

Duerksen, John H., to Chevron Research Company. Steam, noncondensable gas and foam for steam and distillation drive in subsurface petroleum production. 4,488,598, Cl. 166-252.000.

Duffer, Paul F.; Franz, Helmut; and Kelly, Joseph D., to PPG Industries, Inc. Two step interleaving method. 4,489,106, Cl. 427-154.000.

Dunlop Limited: *See*—
Marjoram, Robert H., 4,488,613, Cl. 180-89.150.

du Parc, Jacques G. M., to Societe Nationale Industrielle Aerospatiale. Non-dissipative LC snubber circuit. 4,489,373, Cl. 363-56.000.

Duplessis, Philippe; and Brusa, Michel, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Signal distribution system for a time-division exchange. 4,489,412, Cl. 370-16.000.

Du Pont de Nemours, E. I., and Company: *See*—
Ashcraft, Robert W.; and Moehlmann, Jon G., 4,489,153, Cl. 430-253.000.
Brixner, Lothar H., 4,488,983, Cl. 252-301.40H.
Chang, Tzu-Ching, 4,489,209, Cl. 564-425.000.
Krahler, Stanley E., 4,489,006, Cl. 260-462.00R.
Schmiegel, Walter W., 4,489,196, Cl. 525-326.300.
Spencer, Dudley W. C., 4,488,961, Cl. 210-136.000.
Taylor, Harvey W., Jr., 4,489,154, Cl. 430-253.000.

Dupre, Gilbert J. Paper padding or tableting press. 4,488,845, Cl. 412-10.000.

Durodyne, Inc.: *See*—
Dougherty, Robert C., 4,488,921, Cl. 156-172.000.

Duval Corporation: *See*—
Hunt, Charles D'A., 4,488,902, Cl. 75-10.00R.

Duvdevani, Ilan: *See*—
Lundberg, Robert D.; Peiffer, Dennis G.; Duvdevani, Ilan; and Kowalik, Ralph M., 4,489,180, Cl. 523-175.000.

Dyckerhoff & Widmann Aktiengesellschaft: *See*—
Auer, Peter; Kluge, Fritz; Lieske, Helmut; and Wutzler, Host, 4,489,024, Cl. 264-71.000.

Dynamit Nobel AG: *See*—
Feld, Marcel, 4,488,999, Cl. 260-429.00R.

Dynamit Nobel Aktiengesellschaft: *See*—
Schoffl, Rainer, 4,488,489, Cl. 102-489.000.

Dynapol: *See*—
Wang, Patricia C.; and Dawson, Daniel J., 4,489,197, Cl. 525-328.200.

Dziark, John J., to General Electric Company. One-component RTV silicone rubber compositions with good self-bonding properties to acrylate plastics. 4,489,200, Cl. 528-18.000.

E.N.I. Nazionale Idrocarburi: *See*—
Olivieri, Roberto; Eletti Bianchi, Giancarlo; Fascetti, Eugenio; Centini, Felice; Degen, Ludwig; and Marconi, Walter, 4,489,208, Cl. 562-470.000.

E. R. Squibb & Sons, Inc.: *See*—
Varma, Ravi K., 4,488,995, Cl. 260-397.450.

E. W. Buschman Company: *See*—
Vogt, Robert K.; and Heit, Martin A., 4,488,639, Cl. 198-787.000.

Early, Robert M.: *See*—
O'Connor, James M.; Schnabel, Wilhelm J.; Rosin, Michael L.; and Early, Robert M., 4,489,177, Cl. 521-164.000.

EASCO Corporation: *See*—
Ballone, Michael P.; and Meisner, Edward H., 4,488,460, Cl. 81-60.000.

Eastman Kodak Company: *See*—
Dann, Bert H., 4,489,354, Cl. 360-64.000.
Godshalk, Russell L.; Bray, Richard L.; and Wood, Lawrence M., 4,488,670, Cl. 226-10.000.
Jones, Glenn C.; and Culver, Larry J., 4,489,188, Cl. 524-292.000.

Eastwell, John R., to Racal Communications Equipment Limited. Direction finding. 4,489,327, Cl. 343-432.000.

Eaton Corporation: *See*—
Goscenski, Edward J., Jr., 4,488,454, Cl. 74-650.000.

Ebata, Yasuo; Suzuki, Hitoshi; Matsumura, Sadao; and Fukuta, Katsuyoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Temperature compensated surface acoustic wave device. 4,489,250, Cl. 310-313.00A.

Eber, Robert J.; and Janda, Bruce W., to James River-Dixie/Northern, Inc. Fibrous webs of enhanced bulk and method of manufacturing same. 4,488,932, Cl. 162-9.000.

Ebert, William S.; Reynolds, Harold D.; Sjostrom, William J.; and Strollo, Robert R., to International Business Machines Corporation. Precision liquid coating apparatus for an electrolytic printer. 4,488,684, Cl. 239-222.000.

Ebner, Franz: *See*—
Drexler, Hermann-Josef; Ebner, Franz; Hille, Hans-Dieter; and Roth, Ulrich, 4,489,135, Cl. 428-423.100.

Eckardt, Georg-Wolfgang: *See*—
Keil, Karl-Heinz; Greiner, Ulrich; Eckardt, Georg-Wolfgang; and Kohler, Volker, 4,488,974, Cl. 252-8.800.

Eckels, Phillip W., to Electric Power Research Institute, Inc. Coupling for cryogenic liquid transfer into rotating apparatus. 4,488,406, Cl. 62-55.000.

Eckhardt, Fritz, to Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH. Electric lamp. 4,489,252, Cl. 313-318.000.

Ecklund, Lawrence M., to Motorola, Inc. Signal interference protection circuit for AM stereo receiver. 4,489,431, Cl. 381-15.000.

Eddy, William C., to Bendix Corporation, The. Positive displacement air delivery system for an internal combustion engine. 4,488,400, Cl. 60-274.000.

Edling, Ellsworth A.; McKenna, Richard P.; Trexler, Frederick D.; and Peterick, E. Thomas, Jr. Atomic battery with beam switching. 4,489,269, Cl. 322-2.00R.

Edwards, Evan A. Photographic still camera film system. 4,488,796, Cl. 354-275.000.

Egawa, Hideharu; and Okumura, Katsuya, to Tokyo Shibaura Denki Kabushiki Kaisha. Bonding wire, semiconductor device having the same, and bonding method using the same. 4,488,674, Cl. 228-179.000.

Ehemann, George M., Jr., to RCA Corporation. Photodepositing a CRT screen structure using discrete-element optical filter. 4,488,793, Cl. 354-1.000.

Eichelberger, Charles W.: *See*—
Miller, Edward B.; and Eichelberger, Charles W., 4,489,385, Cl. 364-493.000.

Eicher Associates, Inc.: *See*—
Eicher, George J., 4,488,835, Cl. 405-83.000.

Eicher, George J., to Eicher Associates, Inc. Penstock fish diversion system. 4,488,835, Cl. 405-83.000.

Eickmann, Karl. Vehicle with propeller-pairs and automatic synchronization with power division. 4,488,692, Cl. 244-55.000.

Ekwuribe, Nnochiro: *See*—
Walton, Alan G.; Sparer, Randall V.; and Ekwuribe, Nnochiro, 4,489,065, Cl. 424-180.000.

Electric Power Research Institute, Inc.: *See*—
Eckels, Phillip W., 4,488,406, Cl. 62-55.000.
Elektro Diesel: *See*—
Widegren, Lars, 4,488,586, Cl. 144-363.000.
Eletti Bianchi, Giancarlo: *See*—
Olivieri, Roberto; Eletti Bianchi, Giancarlo; Fascetti, Eugenio; Centini, Felice; Degen, Ludwig; and Marconi, Walter, 4,489,208, Cl. 562-470.000.
Elger, Walter: *See*—
Vorbruggen, Helmut; Schwarz, Norbert; Loge, Olaf; and Elger, Walter, 4,489,092, Cl. 424-304.000.
Elmer, Thomas H.: *See*—
Borrelli, Nicholas F.; Elmer, Thomas H.; Morse, David L.; and Sachenik, Paul A., 4,488,864, Cl. 430-13.000.
Elmis, Herbert: *See*—
Gollinger, Wolfgang; Schat, Hermannus; Holzmann, Dieter; Elmis, Herbert; Struthoff, Holger; and Kunz, Detlev, 4,489,342, Cl. 358-17.000.
Elson, Lloyd C. Article dropping balloon. 4,488,374, Cl. 446-220.000.
Empak, Inc.: *See*—
Hooper, Mark W.; and Voorhees, Edward J., 4,488,834, Cl. 405-58.000.
Encor, Limited: *See*—
Hurtig, Carl R., 4,488,461, Cl. 81-98.000.
Endres, Dan D.; and Matray, Attila, to Kimberly-Clark Corporation. Soft moisture resistant tissue product. 4,489,118, Cl. 428-154.000.
Energy Research Corporation: *See*—
Chi, Chang V.; and Baker, Bernard S., 4,489,142, Cl. 429-26.000.
Enertec: *See*—
Merle, Jean-Pierre, 4,488,690, Cl. 242-192.000.
Engel, Rolf R. Topical agent for transcutaneous measurement of partial pressure of oxygen. 4,488,557, Cl. 128-635.000.
Engineers Sales-Service Co., Inc.: *See*—
Ivins, Earl E.; and Ivins, John L., 4,488,852, Cl. 417-211.500.
English, George A.: *See*—
Cavagnero, Erman V.; English, George A.; and Marracino, Charles R., 4,488,825, Cl. 384-152.000.
Epel, Joseph N.; and Wilkinson, Robert E., to Budd Company, The. Compression molding apparatus having vacuum chamber. 4,488,862, Cl. 425-405.00R.
Epson Corporation: *See*—
Owatari, Akio, 4,489,334, Cl. 346-104.00R.
Erbe, Alfred R., to United States of America, Navy. Dead-faced electrical connector with electromagnetic vulnerability protection. 4,488,765, Cl. 339-42.000.
Erbstoesser, Steven R.: *See*—
Graham, Robert L.; and Erbstoesser, Steven R., 4,488,599, Cl. 166-255.000.
ERCO Industries Limited: *See*—
Twardowska, Helena, 4,489,183, Cl. 523-440.000.
Erickson, Gerald J.: *See*—
Chan, Kasun K.; Erickson, Gerald J.; Schuck, David B.; and Stone, James W., 4,488,354, Cl. 29-830.000.
Eriksson, Bengt S.: *See*—
Petersson, Stig A.; and Eriksson, Bengt S., 4,489,046, Cl. 423-88.000.
Erstfeld, Thomas E.: *See*—
Quinlar Kenneth P.; and Erstfeld, Thomas E., 4,488,914, Cl. 148-175.000.
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Farkas, Tibor; Horvath, Ibolya; Horvath, Laszlo I.; Vigh, Laszlo; Dombay, Zsolt; Nagy, Jozsef; Nagy nee Gera, Emilia; Pavliscsak, Csaba; and Tarpai, Gyula, 4,488,901, Cl. 71-121.000.
ETA S.A., Fabriques d'Ebauches: *See*—
Muller, Jacques; and Mock, Elmar, 4,488,345, Cl. 29-177.000.
Schaffner, Jean-Claude, 4,488,819, Cl. 368-220.000.
Ethyl Corporation: *See*—
Laran, Roy J., 4,489,051, Cl. 423-644.000.
Eue, Ludwig: *See*—
Stetter, Jorg; Ditgens, Klaus; Thomas, Rudolf; Eue, Ludwig; and Schmidt, Robert R., 4,488,895, Cl. 71-90.000.
Evak Sanitar AB: *See*—
Hellers, Bo G., 4,488,963, Cl. 210-170.000.
Evans, John A.: *See*—
Pulliam, Daniel L.; Evans, John A.; Wilbur, David L.; and Fox, Robert D., 4,489,140, Cl. 428-654.000.
Eventoff, Franklin N. Electronic pressure sensitive force transducer. 4,489,302, Cl. 338-99.000.
Everest & Jennings, Inc.: *See*—
Brodsky, Stephen L., 4,489,256, Cl. 318-87.000.
Ewing, John J.: *See*—
Frank, Robert G.; Claassen, George R.; and Ewing, John J., 4,488,892, Cl. 65-106.000.
Ex-Cell-O Corporation: *See*—
Fitzpatrick, Paul, 4,488,418, Cl. 72-88.000.
Moore, James I.; and Van Huis, Philip J., 4,488,589, Cl. 164-155.000.
Wise, Daniel J.; and Woodhall, Donna M., 4,489,112, Cl. 428-35.000.
Exxon Corporation: *See*—
Moshier, Stephen L., 4,489,434, Cl. 381-43.000.
Moshier, Stephen L., 4,489,435, Cl. 381-43.000.
Exxon Production Research Co.: *See*—
Graham, Robert L.; and Erbstoesser, Steven R., 4,488,599, Cl. 166-255.000.
Exxon Research and Engineering Co.: *See*—
Lundberg, Robert D.; Peiffer, Dennis G.; Duvdevani, Ilan; and Kowalik, Ralph M., 4,489,180, Cl. 523-175.000.
Ezis, Andre; and Copple, Warren B., to Ford Motor Company. Method of hot pressing reactive materials. 4,489,032, Cl. 264-325.000.
Fairchild Camera & Instrument Corp.: *See*—
Vora, Madhukar B.; and Herndon, William H., 4,488,350, Cl. 29-577.00C.
Fairchild Weston Systems, Inc.: *See*—
Davis, William R.; and Hart, David G., 4,489,358, Cl. 360-137.000.
Outhwaite, Stephen J., 4,489,236, Cl. 250-252.100.
Falk, Jerry: *See*—
Carey, Richard A.; and Falk, Jerry, 4,489,380, Cl. 364-200.000.
Falk, Roger B.; and Tyree, William H., to United States of America, Energy. Personnel electronic neutron dosimeter. 4,489,315, Cl. 340-600.000.
Fan, Mark J., to Mobil Oil Corporation. Recovery of heavy oil by steam flooding combined with a nitrogen drive. 4,488,600, Cl. 166-263.000.
Fandrich, Helmut E. Rotary cone harvester. 4,488,396, Cl. 56-328.00R.
Fanning, William J., to AT&T Technologies, Inc. Magazining device for use with automatic component assembling machine. 4,488,662, Cl. 221-197.000.
Farkas, Tibor; Horvath, Ibolya; Horvath, Laszlo I.; Vigh, Laszlo; Dombay, Zsolt; Nagy, Jozsef; Nagy nee Gera, Emilia; Pavliscsak, Csaba; and Tarpai, Gyula, to Eszakmagyarorszagi Vegyimuvek. Compositions for increasing the cold resistance of cultivated plants and a method for the utilization of such compositions. 4,488,901, Cl. 71-121.000.
Farmer, Paul L., to Atasi Corporation. Enclosed disk drive with improved air filtration system. 4,489,356, Cl. 360-97.000.
Farmont, Johann H. Securing means for log construction. 4,488,389, Cl. 52-233.000.
Fascetti, Eugenio: *See*—
Olivieri, Roberto; Eletti Bianchi, Giancarlo; Fascetti, Eugenio; Centini, Felice; Degen, Ludwig; and Marconi, Walter, 4,489,208, Cl. 562-470.000.
Faucher, James M., to C.E.M. Co., Inc. Thermal press having insert driving air biasing mechanism. 4,488,672, Cl. 227-156.000.
Fedeli, Gianfranco, to Mediolanum Farmaceutici S.r.L. Arterial polysaccharide complex, a method for its preparation and composition comprising same. 4,489,066, Cl. 424-181.000.
Federal Mogul Corporation: *See*—
Thompson, Ronald J., 4,488,826, Cl. 384-288.000.
Feigl, Werner, to Siemens Aktiengesellschaft. Modular plug. 4,488,769, Cl. 339-103.00M.
Feld, Marcel, to Dynamit Nobel AG. Method for the recovery of cobalt oxalate and/or manganese oxalate. 4,488,999, Cl. 260-429.00R.
Felix, Raymond A., to Stauffer Chemical Company. Substituted benzyloxy chloroethoxy ethane herbicide antidotes. 4,489,007, Cl. 260-465.00F.
Fenn, Robert W., III; Pless, Emory J.; Harris, Richard L.; and O'Leary, Kevin J., to Diamond Shamrock Chemicals Company. Preparation of dimensionally stable asbestos diaphragms. 4,489,025, Cl. 264-104.000.
Ferton, Daniel, to Societe de Vente de l'Aluminium Pechiney. Method for interrupted hardening of aluminum-base alloys. 4,488,913, Cl. 148-12.70A.
Fiedziuszko, Slawomir J., to Ford Aerospace & Communications Corporation. Miniature dual-mode, dielectric-loaded cavity filter. 4,489,293, Cl. 333-202.000.
Figgie International Inc.: *See*—
Morgan, Steven J.; Lauyans, Frank M.; and Judge, Gregory A., 4,488,638, Cl. 198-781.000.
Fikentscher, Rolf; Fleischer, Herbert; Heimann, Sigismund; and Mertens, Heinrich, to BASF Aktiengesellschaft. Process for dyeing textile materials of polyacrylonitrile: quaternized piperazine copolymer as basic dye retarder. 4,488,879, Cl. 8-539.000.
Finish Engineering Company, Inc.: *See*—
Claunch, Charles K.; and Bowes, David, 4,488,933, Cl. 202-83.000.
Finkelstein, Wolfgang: *See*—
Haaz, Josef; Finkelstein, Wolfgang; and Baumeister, Gregor, 4,488,575, Cl. 137-499.000.
Fischer, Karl. Method and apparatus for manufacture of a vessel. 4,488,538, Cl. 126-390.000.
Fitch, Robert H.: *See*—
Larson, Eric H.; Kurtz, Bruce E.; and Fitch, Robert H., 4,488,948, Cl. 204-98.000.
Fitzpatrick, Patrick C.: *See*—
Brown, Peter L.; Fitzpatrick, Patrick C.; and Lloyd, Frederick W., 4,488,719, Cl. 272-72.000.
Fitzpatrick, Paul, to Ex-Cell-O Corporation. Apparatus for roll sizing diameters. 4,488,418, Cl. 72-88.000.
Flaska, Joseph M.; and Wittemann, Robert F., to Johnson & Johnson Baby Products. Two-piece sifter closure for fillable container. 4,488,668, Cl. 222-548.000.
Fleischer, Herbert: *See*—
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Flood, James R. Skin packaging technique providing paint masking. 4,489,116, Cl. 428-138.000.
Florance, Richard K.; and Sequeira, Joel A., to Schering Corporation. Betamethasone dipropionate cream. 4,489,071, Cl. 424-243.000.
Flowcon Oy: *See*—
Sarkkinen, Veli, 4,488,907, Cl. 106-14.110.
FMC Corporation: *See*—
Lindow, Carl E., 4,489,257, Cl. 318-258.000.

Focke & Co.: *See*—
Focke, Heinz; and Mutschall, Hugo, 4,488,632, Cl. 198-420.000.
Focke, Heinz; and Mutschall, Hugo, to Focke & Co. Cigarette grouping apparatus with yieldable stop member. 4,488,632, Cl. 198-420.000.
Foerg, Wolfgang; Scholz, Walter; and Marold, Freimut, to Linde Aktiengesellschaft. Low temperature separation of gaseous mixture for methanol synthesis. 4,488,890, Cl. 62-17.000.
Fogarty, Bruce C.: *See*—
Newell, Burtram I.; Bertolette, Reed; and Fogarty, Bruce C., 4,488,423, Cl. 72-385.000.
Fomin, Georgy M.: *See*—
Trubitsin, Alexandr V.; Polyakov, Mikhail G.; Fomin, Georgy M.; Denisov, Petr I.; Petrov, Pavel E.; and Pomelnikov, Petr P., 4,488,688, Cl. 242-78.000.
Foos, Joseph S.: *See*—
Abraham, Kuzhikalail M.; Brummer, S. Barry; and Foos, Joseph S., 4,489,145, Cl. 429-197.000.
Ford Aerospace & Communications Corporation: *See*—
Fiedziuszko, Slawomir J., 4,489,293, Cl. 333-202.000.
Ford, David A.: *See*—
Hill, Anthony D.; Ford, David A.; Goulette, Michael J.; and Arthey, Roger P., 4,488,915, Cl. 148-404.000.
Ford Motor Company: *See*—
Almor, Emil, 4,488,520, Cl. 123-90.390.
Ezra, Andre; and Copple, Warren B., 4,489,032, Cl. 264-325.000.
Forester, Donald W.; Lubitz, Peter; and Vittoria, Carmine, to United States of America, Navy. Solid state hydrogen pumping and storage material. 4,489,049, Cl. 423-644.000.
Formica, Fulvio: *See*—
Beltrami, Giovanni; and Formica, Fulvio, 4,488,867, Cl. 431-12.000.
Forshey, Terry L.: *See*—
Isenberg, Gerry E.; Forshey, Terry L.; and Keller, Robert D., Jr., 4,488,711, Cl. 266-276.000.
Forward, Cleve H.: *See*—
Butler, James R.; Kendall, Debra L.; Forward, Cleve H.; Watson, James M.; and Branum, Gary D., 4,489,214, Cl. 585-467.000.
Fory, Werner; Martin, Henry; and Pissiotas, Georg, to Ciba-Geigy Corporation. Oxime derivatives for protecting plant crops. 4,488,898, Cl. 71-96.000.
Fory, Werner; Martin, Henry; and Pissiotas, Georg, to Ciba-Geigy Corporation. Oxime derivatives for protecting plant crops. 4,488,899, Cl. 71-105.000.
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Foti, Frederick A. Sliding door weather-sealing device and assembly. 4,488,387, Cl. 52-207.000.
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Tseung, Alfred C. C.; Chan, Ho C.; Fouzder, Nani B.; and Sriskandarajah, Thurairajah, 4,488,578, Cl. 138-146.000.
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Baugh, Benton F.; Henderson, Herman O., Jr.; Fowler, John H.; and Ahlstone, Arthur, 4,488,740, Cl. 285-84.000.
Fox, Daniel W.; Gallucci, Robert R.; Peters, Edward N.; and Smith, Gary F. Thermoplastic polycarbonate-polysulfone carbonate molding compositions. 4,489,181, Cl. 523-219.000.
Fox, Robert D.: *See*—
Pulliam, Daniel L.; Evans, John A.; Wilbur, David L.; and Fox, Robert D., 4,489,140, Cl. 428-654.000.
Fox, Robert L.; Frizzill, Alan W.; Little, Bruce D.; Progar, Donald J.; Coultrip, Robert H.; Couch, Richard H.; Gleason, John R.; Stein, Bland A.; Buckley, John D.; and St. Clair, Terry L., to United States of America, National Aeronautics and Space Administration. Hot melt adhesive attachment pad. 4,488,335, Cl. 24-304.000.
Fracker, Clarence E., Jr.: *See*—
Grubka, Lawrence J.; and Fracker, Clarence E., Jr., 4,488,891, Cl. 65-2.000.
Franck, Donald R.; and Grady, Warren G., Jr. Hockey stick blade with synthetic coating and exposed wear resistant base. 4,488,721, Cl. 273-67.00A.
Frank, Robert G.; Claassen, George R.; and Ewing, John J., to PPG Industries, Inc. Pivotal shaped auxiliary gas heater for glass sheet shaping molds. 4,488,892, Cl. 65-106.000.
Franz, Helmut: *See*—
Duffer, Paul F.; Franz, Helmut; and Kelly, Joseph D., 4,489,106, Cl. 427-154.000.
Franzolini, Luciano, to SP, EL. s.r.l. Circuit and a method for processing amplitude and phase variable multiphase signals, which are required as current or voltage reference to drive synchronous motors. 4,489,266, Cl. 318-800.000.
French, John, to Mars, Limited. High frequency pulse generating circuit. 4,489,288, Cl. 331-87.000.
Frito-Lay, Inc.: *See*—
Rooke, Robert J.; Skierski, James E.; and Brockie, Raymond V., 4,488,464, Cl. 83-99.000.
Frizzill, Alan W.: *See*—
Fox, Robert L.; Frizzill, Alan W.; Little, Bruce D.; Progar, Donald J.; Coultrip, Robert H.; Couch, Richard H.; Gleason, John R.; Stein, Bland A.; Buckley, John D.; and St. Clair, Terry L., 4,488,335, Cl. 24-304.000.
Frohberger, Paul-Ernst: *See*—
Stetter, Jorg; Buchel, Karl H.; Reinecke, Paul; Brandes, Wilhelm; and Frohberger, Paul-Ernst, 4,489,081, Cl. 424-269.000.
Froix, Michael F., to Celanese Corporation. Blend of polyalkylene terephthalate and wholly aromatic polyester. 4,489,190, Cl. 524-539.000.
Fromm AG: *See*—
Rauch, Manfred; and Synek, Wenzel, 4,488,926, Cl. 156-379.800.
Frye, James A. Draw works. 4,488,708, Cl. 254-355.000.
Fu, John W., to Westinghouse Electric Corp. Vapor corrosion rate monitoring method and apparatus. 4,488,939, Cl. 204-1.00T.
Fuji Electric Company, Ltd.: *See*—
Kuroki, Kazuo, 4,489,279, Cl. 328-134.000.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Morikawa, Kouji, 4,488,528, Cl. 123-425.000.
Fuji Photo Film Co., Ltd.: *See*—
Hatanaka, Isamu; Sekine, Takashi; and Yazawa, Kenichiro, 4,488,810, Cl. 356-244.000.
Sakanoue, Kei; Hirano, Shigeo; and Adachi, Keiichi, 4,489,155, Cl. 430-505.000.
Watanabe, Shojiro; and Matsukawa, Hiroharu, 4,489,337, Cl. 346-209.000.
Fuji Xerox Co., Ltd.: *See*—
Sunaga, Ryuzo; and Joh, Seiji, 4,488,802, Cl. 355-3.0CH.
Fujii, Setsuro; Hamakawa, Toshihiro; Ogawa, Kazuo; Muranaka, Yoshiyuki; and Hashimoto, Sadao, to Taiho Pharmaceutical Company Limited. Antilipemic and anti-inflammatory compositions containing sulfonate derivatives. 4,489,091, Cl. 424-278.000.
Fujii, Tadaaki: *See*—
Masuda, Naosuke; Suzuki, Yoshio; and Fujii, Tadaaki, 4,488,475, Cl. 91-462.000.
Fujimoto, Mitsuru; Shima, Yoshiharu; Motooka, Hironobu; and Kikuchi, Minoru, to Sumitomo Rubber Industries, Ltd. Tire inspecting apparatus. 4,488,430, Cl. 73-146.000.
Fujioka, Yoshisato, to Ricoh Company, Ltd. Small-size wide angle lens. 4,488,788, Cl. 350-465.000.
Fujisawa Pharmaceutical Co., Ltd.: *See*—
Fukuoka, Hisatomi; and Yamaguchi, Hisami, 4,488,656, Cl. 215-307.000.
Fujita, Sumio: *See*—
Fukuichi, Takuro; Kusumoto, Yasuo; Fujita, Sumio; and Kawamura, Shuji, 4,489,437, Cl. 381-51.000.
Fujita, Yoshitaka: *See*—
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Inaba, Hajimu; Sakakibara, Shinsuke; and Nihei, Ryo, 4,488,746, Cl. 294-86.00R.
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Fukatsu, Kunio: *See*—
Yamauchi, Masahide; and Fukatsu, Kunio, 4,488,367, Cl. 40-531.000.
Fukuichi, Takuro; Kusumoto, Yasuo; Fujita, Sumio; and Kawamura, Shuji, to Seiko Instruments & Electronics Ltd. Speech synthesizer. 4,489,437, Cl. 381-51.000.
Fukuma, Toshiaki, to Shimadzu Corporation. Base-line correction means for spectrophotometer system. 4,488,811, Cl. 356-319.000.
Fukuoka, Hisatomi; and Yamaguchi, Hisami, to Fujisawa Pharmaceutical Co., Ltd. Stopper for vials. 4,488,656, Cl. 215-307.000.
Fukuta, Katsuyoshi: *See*—
Ebata, Yasuo; Suzuki, Hitoshi; Matsumura, Sadao; and Fukuta, Katsuyoshi, 4,489,250, Cl. 310-313.00A.
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Marutake, Yozo; Fukutome, Tatsuro; Asami, Motomu; and Motohashi, Hideo, 4,489,330, Cl. 343-742.000.
Fuller, Larry E.: *See*—
Klein, Elias; Wathen, Ronald L.; Ward, Richard A.; Cosentino, Louis C.; Fuller, Larry E.; and Martinez, Felix J., 4,488,877, Cl. 604-175.000.
Funaki, Yuji: *See*—
Ishiguru, Yukio; Takano, Hirotaka; and Funaki, Yuji, 4,489,082, Cl. 424-269.000.
Funk, Roger S., to R. Funk & Co. Inc. Apparatus for controlling the flow of water to a diazo printer. 4,488,797, Cl. 354-298.000.
Furuya, Akira: *See*—
Katsumata, Ryoichi; Oka, Tetsuo; and Furuya, Akira, 4,489,160, Cl. 435-253.000.
Gaddi, Bruno, to Piaggio & C. S.p.A. Body for motorscooter. 4,488,618, Cl. 180-219.000.
Gagnon, Yvon P., to Porritts & Spencer, Inc. Batt-on-mesh press felt having increased abrasion resistance, batt retention and dimensional stability. 4,489,125, Cl. 428-235.000.
Galatis, Telemachus N. Barge carrying ship and method of loading same. 4,488,503, Cl. 114-260.000.
Galer, Richard E.; and Webb, Paul C., to United States Gypsum Company. Non-expansive, rapid setting cement. 4,488,909, Cl. 106-89.000.
Galer, Richard E.: *See*—
Porter, Michael J.; and Galer, Richard E., 4,488,917, Cl. 156-39.000.
Gallucci, Robert R.: *See*—
Fox, Daniel W.; Gallucci, Robert R.; Peters, Edward N.; and Smith, Gary F., 4,489,181, Cl. 523-219.000.
Gammon, Jimmie L., to Liquid Power, Inc. Fluid-actuated ram. 4,488,473, Cl. 91-50.000.
Gancy, Alan B. Coarse-particle calcium/magnesium acetate suitable for roadway and walkway deicing, and process for its manufacture. 4,488,978, Cl. 252-70.000.

Ganz, Jorg, to Sig. Societe Industrielle Suisse. Railway track tamping machine. 4,488,492, Cl. 104-12.000.
Garcia, Juan A. S. Therapeutic adapter. 4,488,541, Cl. 128-79.000.
Garrett, David W.: *See*—
Black, Denny E.; and Garrett, David W., 4,489,131, Cl. 428-391.000.
Garvey, Norman G. Bag holder. 4,488,697, Cl. 248-101.000.
Gast, Theodor; Binder, Kurt; and Honig, Gunter, to Robert Bosch GmbH. Mass flow meter with vibration sensor. 4,488,439, Cl. 73-861.180.
Gated Devices, Inc.: *See*—
Plumb, Edwin W., 4,488,630, Cl. 192-134.000.
Gears, Trevor. Plural microstrip slot antenna. 4,489,328, Cl. 343-700.0MS.
Gebhardt, Hans, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Power take-off of an internal combustion engine. 4,488,447, Cl. 74-397.000.
Gebr. Trox GmbH: *See*—
Haaz, Josef; Finkelstein, Wolfgang; and Baumeister, Gregor, 4,488,575, Cl. 137-499.000.
Gehlhaus, Juergen: *See*—
Welters, Reiner; Gehlhaus, Juergen; and Moeschl, Gernot, 4,489,057, Cl. 424-47.000.
Geiersbach, Allois F.: *See*—
Zajac, Charles J.; and Geiersbach, Allois F., 4,488,382, Cl. 51-165.920.
General Electric Company: *See*—
Baker, Lewin T.; and Huber, Paul G., 4,489,420, Cl. 375-94.000.
Beachy, Robert W., 4,489,268, Cl. 320-2.000.
Castonguay, Roger N.; McCuin, Jon P.; and Powell, David B., 4,489,362, Cl. 361-339.000.
Chung, Rack H., deceased, 4,489,191, Cl. 524-779.000.
Dziark, John J., 4,489,200, Cl. 528-18.000.
Grass, Joseph J.; and Dobberstein, Robert J., 4,489,426, Cl. 378-150.000.
Harnden, John D., Jr.; Kornrumpf, William P.; and Holub, Fred F., 4,489,234, Cl. 219-347.000.
Herbst, LeRoy J.; and Preher, John L., 4,488,666, Cl. 222-651.000.
Jamrus, Kenneth J., 4,489,036, Cl. 376-229.000.
Johnson, Peter D.; and Grubb, Willard T., 4,489,301, Cl. 337-401.000.
Jones, William B., Jr., 4,489,415, Cl. 372-38.000.
Mawyer, Helene B. N.; and Welch, Derek S., 4,489,377, Cl. 364-167.000.
Miller, Edward B.; and Eichelberger, Charles W., 4,489,385, Cl. 364-493.000.
Nolan, Mary E.; and LaConti, Anthony B., 4,488,951, Cl. 204-129.000.
O'Donnell, Matthew, 4,488,434, Cl. 73-602.000.
Stokes, Vijay K., 4,488,745, Cl. 293-155.000.
Wengrovius, Jeffrey H., 4,489,199, Cl. 528-16.000.
General Motors Corporation: *See*—
Leuer, Karl-Rudi, 4,488,448, Cl. 74-473.00R.
Lui, Hoi; and Brinn, Benjamin F., Jr., 4,488,770, Cl. 339-263.00R.
Smith, Jack E., 4,488,498, Cl. 112-80.000.
Waite, Lynn E., 4,488,831, Cl. 403-209.000.
Gentex Corporation: *See*—
Bauer, Frederick T.; and Bechtel, Jon H., 4,488,777, Cl. 350-279.000.
Georgopulos, Thomas; and Cioper, Thomas A., to GTE Automatic Electric Inc. Electro-optic indicating device. 4,488,772, Cl. 350-331.00R.
Gerber, Curtis E. Adjustable windshield for a vehicle. 4,488,750, Cl. 296-78.00R.
Gey, Michel: *See*—
Delassus, Jean; Gey, Michel; Comensoli, Jean-Claude; and Pouger, Paul, 4,489,218, Cl. 174-35.00R.
Gharadjedaghi, Fereydoun: *See*—
Saurer, Eric; Gharadjedaghi, Fereydoun; and Ruedin, Yves, 4,488,818, Cl. 368-71.000.
Giaimo, Anthony; and Zylbert, Thaddeus J., to Singer Company, The. Replaceable hook point and needle guard for sewing machine loop taker. 4,488,499, Cl. 112-230.000.
Gibson, David K., to International Business Machines Corporation. Maximum throughput duplexing system for xerographic machines. 4,488,801, Cl. 355-3.0SH.
Gibson, Kirk R., to Chevron Research Company. Large pore shaped hydroprocessing catalysts. 4,489,173, Cl. 502-313.000.
Gibson, Larry R. Climbing apparatus. 4,488,620, Cl. 182-135.000.
Giglia, Robert D., to American Cyanamid Company. Method for manufacturing an electrochromic display device and device produced thereby. 4,488,781, Cl. 350-357.000.
Gilbert, Marian; and Kaun, Thomas D., to United States of America, Energy. Lithium aluminum/iron sulfide battery having lithium aluminum and silicon as negative electrode. 4,489,143, Cl. 429-103.000.
Gilker, Clyde: *See*—
Hurley, James R.; and Gilker, Clyde, 4,489,384, Cl. 364-483.000.
Gillette Company, The: *See*—
Jacobson, Chester F., 4,488,357, Cl. 30-57.000.
Ginsberg, Howard S., to United States of America, Navy. Control circuit for a flyback stepcharger. 4,489,369, Cl. 363-21.000.
Gipson, Robert M.: *See*—
Cuscurida, Michael; and Gipson, Robert M., 4,488,982, Cl. 252-174.210.
Girard, William J. Mooring device. 4,488,502, Cl. 114-230.000.
Giudice, Antonina; Moulineau, Claude; Manara, Luciano; and Carminati, Paolo, to Sonofi. Pharmaceutical compositions having a peripheral antagonistic action with respect to opiates. 4,489,079, Cl. 424-260.000.
Glanvall, Rune V., to Stal Refrigeration AB. Compressor with radial inlet to screw-formed rotor. 4,488,858, Cl. 418-195.000.
Glavan, Kenneth A.: *See*—
Deutsch, Edward A.; and Glavan, Kenneth A., 4,489,054, Cl. 424-1.100.
Glaverbel: *See*—
Robyn, Pierre; and Deschepper, Pierre, 4,489,022, Cl. 264-30.000.
Gleason, John R.: *See*—
Fox, Robert L.; Frizzill, Alan W.; Little, Bruce D.; Progar, Donald J.; Coultrip, Robert H.; Couch, Richard H.; Gleason, John R.; Stein, Bland A.; Buckley, John D.; and St. Clair, Terry L., 4,488,335, Cl. 24-304.000.
Glennon, Timothy F.; Hucker, David J.; and Lenny, Charles M., to Sundstrand Corporation. Control for electrical power conversion system. 4,489,323, Cl. 363-87.000.
Glickson, David A.; and Disko, Harry, to Marvin Glass & Associates. Stackable piece playset. 4,488,373, Cl. 446-4.000.
Glucksman, Dov Z. Hair roller heating unit. 4,489,233, Cl. 219-242.000.
Glyco-Metal Werke: *See*—
Scherer, Michael; and Kubacha, Karl-Heinz, 4,488,956, Cl. 204-298.000.
Go, Seitaro, to Yugen Kaisha Go Chuzo Tekko Sho. Apparatus for automatically adjusting channel box fitting position relative to nuclear fuel assembly. 4,489,037, Cl. 376-261.000.
Godawski, Theodore J., to Zenith Electronics Corporation. Automatic degaussing circuit with switch mode power supply. 4,489,253, Cl. 315-8.000.
Godshalk, Russell L.; Bray, Richard L.; and Wood, Lawrence M., to Eastman Kodak Company. Continuous form feeder. 4,488,670, Cl. 226-10.000.
Goerlich, Lothar, to UTB Umwelttechnik Buchs AG. Biological reactor apparatus for biological decomposition of organic refuse. 4,488,960, Cl. 210-97.000.
Goforth, Ronald D., to Metal Craft Company. U-bolt clamp saddle construction and method of manufacture. 4,488,334, Cl. 24-277.000.
Goldberg, Norman, to Sperry Corporation. Apparatus for cooling integrated circuit chips. 4,489,363, Cl. 361-383.000.
Goldman, Robert N., to Light Signatures, Inc. Non-counterfeitable document system. 4,489,318, Cl. 340-825.340.
Gollinger, Wolfgang; Schat, Hermannus; Holzmann, Dieter; Elmis, Herbert; Struthoff, Holger; and Kunz, Detlev, to ITT Industries, Inc. MOSFET Integrated delay circuit for digital signals and its use in color-television receivers. 4,489,342, Cl. 358-17.000.
Gomes, John M.; Raddatz, Andrea E.; and Baglin, Elizabeth G., to United States of America, Interior. Formation of tungsten monocarbide from a molten tungstate-halide phase by gas sparging. 4,489,044, Cl. 423-53.000.
Gomez, Helio: *See*—
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Gondo, Hisashi; Matsumoto, Ryutaro; Ohno, Jiro; and Suzuki, Ryoichi, to Nippon Steel Corporation. Hydrogen storage metal material. 4,488,906, Cl. 75-123.00M.
Goodman, Alvin M.; and Gossenberger, Herman F., to RCA Corporation. SIPOS Deposition method. 4,489,103, Cl. 427-85.000.
Goodwin, John D.; and Mulkey, Forrest W., III, to Molly Maguire, Inc. Process for preparing a lightweight expanded silicate aggregate from rice hull ash. 4,488,908, Cl. 106-75.000.
Goodyear Tire & Rubber Company, The: *See*—
Shaheen, Frank G.; and Dillon, Jerry J., 4,489,099, Cl. 426-3.000.
Goolsby, Alvin D., to Shell Oil Company. Cathodic protection monitoring system. 4,489,277, Cl. 324-425.000.
Goscenski, Edward J., Jr., to Eaton Corporation. Balking clamp positive drive. 4,488,454, Cl. 74-650.000.
Gossenberger, Herman F.: *See*—
Goodman, Alvin M.; and Gossenberger, Herman F., 4,489,103, Cl. 427-85.000.
Gosudarstvenny Proektno -Konstruktorsky I Eksperimentalny Institut Ugolnoi Promyshlennosti: *See*—
Karmyshin, Nikolai V.; Kudryashov, Evgeny I.; Orlov, Vladimir M.; Levashov, Vladimir M.; Khorin, Vladimir N.; and Antonov, Alexandr D., 4,488,757, Cl. 299-32.000.
Goswami, Jagadish C., to Stauffer Chemical Company. Blend of internally plasticized vinyl chloride copolymer and ethylene/carbon monoxide polymer. 4,489,193, Cl. 525-190.000.
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Grachtrup, Heinz, to Krupp Polysius AG. Device for scaling a ring gear. 4,488,730, Cl. 277-18.000.
Gradeff, Peter S.; and Schreiber, Fred G., to Rhone-Poulenc Inc. Process for the preparation of ceric alkoxides. 4,489,000, Cl. 260-429.200.
Grady, Warren G., Jr.: *See*—
Franck, Donald R.; and Grady, Warren G., Jr., 4,488,721, Cl. 273-67.00A.
Graham, Robert L.; and Erbstoesser, Steven R., to Exxon Production Research Co. Method of controlling displacement of propping agent in fracturing treatments. 4,488,599, Cl. 166-255.000.
Grant, William B.; and Hinkley, E. David, Jr., to United States of America, National Aeronautics and Space Administration. Portable remote laser sensor for methane leak detection. 4,489,239, Cl. 250-339.000.
Grant, Willie T. Automatic valve closer. 4,488,567, Cl. 137-78.100.

Grass, Joseph J.; and Dobberstein, Robert J., to General Electric Company. Collimator with adjustable aperture. 4,489,426, Cl. 378-150.000.
Grassano, Vincent R. Shock-absorbent leash for animals. 4,488,511, Cl. 119-109.000.
Grassmann, Hans-Christian, to Siemens Aktiengesellschaft. Capacitive high-frequency drying apparatus. 4,488,362, Cl. 34-1.000.
Grave, Dale L. Rug and upholstery cleaning apparatus. 4,488,330, Cl. 15-322.000.
Gray, Anthony J.: *See*—
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Greco, Carl C., to Stauffer Chemical Company. Process for forming vanadium phosphorodithioate compounds. 4,489,004, Cl. 260-429.00R.
Greenberger, Joseph I., to Wean United, Inc. Apparatus for optimizing the cooling of a generally circular cross-sectional longitudinal shaped workpiece. 4,488,710, Cl. 266-114.000.
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Keil, Karl-Heinz; Greiner, Ulrich; Eckardt, Georg-Wolfgang; and Kohler, Volker, 4,488,974, Cl. 252-8.800.
Gribble, Joseph J.: *See*—
Lehman, Lewis M.; and Gribble, Joseph J., 4,488,767, Cl. 339-91.00R.
Griffin, Richard A.: *See*—
Cocks, Eric H.; and Griffin, Richard A., 4,488,665, Cl. 222-146.500.
Grollier, Jean F.; and Allec, Josiane, to L'Oreal. Oily composition intended for the treatment of keratin substances and the skin. 4,488,564, Cl. 132-7.000.
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Grubb, Willard T.: *See*—
Johnson, Peter D.; and Grubb, Willard T., 4,489,301, Cl. 337-401.000.
Grubka, Lawrence J.; and Fracker, Clarence E., Jr., to Owens-Corning Fiberglas Corporation. Method for forming glass fibers. 4,488,891, Cl. 65-2.000.
Grumman Aerospace Corporation: *See*—
Miller, John M.; and Barton, Richard O., 4,488,809, Cl. 356-138.000.
Grundy Dispense Systems, Inc.: *See*—
Brown, Anthony D.; and Cerrato, Vincent J., 4,488,572, Cl. 137-315.000.
Gryaznov, Vladimir M.: *See*—
Roshan, Natalia R.; Parfenova, Natalia I.; Polyakova, Viktoria P.; Savitsky, Evgeny M.; Mischenko, Alexandr P.; Gryaznov, Vladimir M.; and Sarylova, Maria E., 4,489,039, Cl. 420-463.000.
Grychtol, Klaus: *See*—
Baumann, Hans; and Grychtol, Klaus, 4,489,002, Cl. 534-695.000.
GTE Automatic Electric Inc.: *See*—
Georgopulos, Thomas; and Cioper, Thomas A., 4,488,772, Cl. 350-331.00R.
GTE Laboratories, Inc.: *See*—
Sarin, Vinod K., 4,488,609, Cl. 175-410.000.
GTE Products Corporation: *See*—
Barakitis, Nikolaos; and Cohen, Sheppard, 4,489,255, Cl. 315-73.000.
Gust, Edward W.; Levendosky, Robert F.; and Hochella, William A., 4,488,356, Cl. 29-882.000.
Guedon, Michel: *See*—
Lafont, Andre ; Rabier, Michel; Guedon, Michel; and Herrouin, Guy, 4,488,614, Cl. 180-127.000.
Guerreau, Rene : *See*—
Beyl, Jean J. A.; Bernard, Jean; Campillo, Christian; Guerreau, Rene ; le Faou, Daniel; and Peyre, Henri, 4,488,734, Cl. 280-605.000.
Guerry-Kopecko, Patricia: *See*—
Milch, Robert A.; Guerry-Kopecko, Patricia; Koeble-Smith, Carol; and Sybert, Edward M., 4,488,912, Cl. 127-41.000.
Guery, Jean-Pierre; and Zwarycz, Andre , to La Telemecanique Electrique. Device for resiliently holding a contact bridge. 4,489,296, Cl. 335-197.000.
Guest, Arnold R., Sr. Mailbox construction. 4,488,677, Cl. 232-34.000.
Gust, Edward W.; Levendosky, Robert F.; and Hochella, William A., to GTE Products Corporation. Method of making electrical contacts. 4,488,356, Cl. 29-882.000.
Gutek, Beth J.; and Van Wert, Bernard, to Dow Corning Corporation. Flexible silicone resin coated fabric. 4,489,127, Cl. 428-266.000.
Haas, Louis M.: *See*—
Williams, Joy L.; Rose, David L.; and Haas, Louis M., 4,488,958, Cl. 209-2.000.
Haaz, Josef; Finkelstein, Wolfgang; and Baumeister, Gregor, to Gebr. Trox GmbH. Volume flow regulator for ventilation systems. 4,488,575, Cl. 137-499.000.
Hachiya, Takashi: *See*—
Ochi, Yukio; Hachiya, Takashi; Miyazaki, Tadayoshi; and Kajita, Yoshihiro, 4,489,167, Cl. 436-518.000.
Haessly, Walter F., to Taylor-Winfield Corporation, The. Flash butt welder for joining flat strip ends. 4,489,229, Cl. 219-100.000.
Hafner, Bernhard: *See*—
Bock, Gunther; Hafner, Bernhard; Muhl, Reinhold; and Thiel, Klaus P., 4,489,146, Cl. 430-5.000.
Haganuma, Tomoyuki, to Ricoh Company, Ltd. Continuous vertical line print control system. 4,488,827, Cl. 400-17.000.
Hagimura, Kazuo: *See*—
Ueda, Jun; Mori, Haruo; Hagimura, Kazuo; Tsukada, Hirokazu; and Kato, Kotaro, 4,489,340, Cl. 357-38.000.
Haginomori, Eiichi: *See*—
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Uesaka, Susumu; Hagiwara, Toshio; Yusen, Akira; Takayama, Minoru; and Urakami, Shinichi, 4,488,817, Cl. 366-149.000.
Haigh, Daniel H.: *See*—
Lay, George E.; Haigh, Daniel H.; and Knipstein, Richard A., 4,489,058, Cl. 424-78.000.
Haines, Marvin L.: *See*—
Herron, Charles R.; Haines, Marvin L.; and O'Quinn, Roger L., 4,489,367, Cl. 362-311.000.
Hal Computers Limited: *See*—
Titherley, Robert H., 4,489,414, Cl. 371-20.000.
Halberschmidt, Friedrich; Audi, Josef; Radermacher, Herbert; and Uberwolf, Heinz, to Saint Gobain Vitrage. Process and device for feeding glass sheets to a furnace. 4,488,846, Cl. 414-152.000.
Hall, Gary M., to Westinghouse Electric Corp. Insulating structure for magnetic coils. 4,489,298, Cl. 336-70.000.
Haller, Ingo: *See*—
Draber, Wilfried; Buchel, Karl H.; Plempel, Manfred; and Haller, Ingo, 4,489,085, Cl. 424-273.00R.
Halliburton Company: *See*—
Almond, Stephen W., 4,488,975, Cl. 252-8.55R.
Halliday, Douglas S., to Tri-Plas Inc. Container lid. 4,488,676, Cl. 229-43.000.
Hallin, Emil L.: *See*—
Litherland, Albert E.; Kilius, Linas R.; and Hallin, Emil L., 4,489,237, Cl. 250-287.000.
Hamakawa, Toshihiro: *See*—
Fujii, Setsuro; Hamakawa, Toshihiro; Ogawa, Kazuo; Muranaka, Yoshiyuki; and Hashimoto, Sadao, 4,489,091, Cl. 424-278.000.
Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Labeler. 4,488,671, Cl. 226-79.000.
Hammann, Ingeborg: *See*—
Maurer, Fritz; Hammann, Ingeborg; and Homeyer, Bernhard, 4,489,088, Cl. 424-273.00P.
Hammett, Robert E., to Standard Oil Company, The. Control of aluminum cross-linked polyacrylamides for sweep improvement. 4,488,601, Cl. 166-270.000.
Handa Giken Kogyo Kabushiki Kaisha: *See*—
Taniuchi, Kazuman, 4,488,428, Cl. 73-118.200.
Handke, Kenneth E. Torque transmitting apparatus and method. 4,488,626, Cl. 192-70.120.
Hang Tjuk Industrial Col Ltd.: *See*—
Cheng, Lap K., 4,488,375, Cl. 446-443.000.
Hanks, Jack G.: *See*—
Wien, Raymond E.; Hanks, Jack G.; and Cotton, John F., 4,489,299, Cl. 337-70.000.
Hansen, V. Gregers, to Raytheon Company. Detector with variance sensitivity. 4,489,319, Cl. 343-7.00A.
Hara, Kiyoshi, to Nippondenso Co., Ltd. Idle speed control apparatus. 4,488,411, Cl. 62-133.000.
Hara, Masahiro; Okamoto, Atsutoshi; and Sakai, Toshiyasu, to Nippondenso Co., Ltd. Method and apparatus for reading a bar code. 4,488,678, Cl. 235-463.000.
Hara, Toshizo, to Diesel Kiki Co., Ltd. Trouble diagnosing apparatus for an automobile air conditioner. 4,488,409, Cl. 62-127.000.
Hargreaves, Rodney B.; McLoughlin, Bernard J.; and Mills, Stuart D., to Imperial Chemical Industries, PLC. 1,3,4-Thiadiazin-5-ones. 4,489,073, Cl. 424-246.000.
Hargreaves, Rodney B.: *See*—
Brown, David; Hargreaves, Rodney B.; McLoughlin, Bernard J.; and Mills, Stuart D., 4,489,074, Cl. 424-246.000.
Harley-Davidson Motor Co., Inc.: *See*—
Buell, Erik F., 4,488,761, Cl. 301-6.00E.
Harnach, Mike: *See*—
Mark, Kelly J., 4,488,649, Cl. 211-49.00S.
Harnden, John D., Jr.; Kornrumpf, William P.; and Holub, Fred F., to General Electric Company. Radiant-energy heating and/or cooking apparatus with honeycomb coverplate. 4,489,234, Cl. 219-347.000.
Harris Corporation: *See*—
Beckwith, Paul B.; Bascle, Kent P.; and Pearce, Jeffrey B., 4,489,389, Cl. 364-522.000.
Harris, James L.: *See*—
Angel, Anthony L.; Harris, James L.; and Dube, Michael F., 4,488,887, Cl. 55-269.000.
Harris, John F., III: *See*—
Bockholt, Karlheinz H.; and Harris, John F., III, 4,488,679, Cl. 235-469.000.
Harris, Richard L.: *See*—
Fenn, Robert W., III; Pless, Emory J.; Harris, Richard L.; and O'Leary, Kevin J., 4,489,025, Cl. 264-104.000.
Harris, Walter L. Snow traction attachment for motorcycles. 4,488,616, Cl. 180-185.000.
Hart, David G.: *See*—
Davis, William R.; and Hart, David G., 4,489,358, Cl. 360-137.000.
Hartkorn, Alfred. Means for spanning the joint between adjoining structural members of a bridge or like structure. 4,488,324, Cl. 14-16.500.
Hartwig, C. Sverker M.; and Ljung, Erik A., to Atlas Copco Aktiebolag. Method and means for feeding electric energy to a portable power tool. 4,489,261, Cl. 318-700.000.
Harz, Gunter. Safety tennis racquet. 4,488,722, Cl. 273-73.00D.
Hase, Georg: *See*—
Bernhardt, Jost; and Hase, Georg, 4,488,546, Cl. 128-201.230.

Hase, Nobutoshi: *See*—
Takeda, Shinji; and Hase, Nobutoshi, 4,489,019, Cl. 264-26.000.
Hasenbeck, Harold W. Rain detector for irrigation control. 4,488,568, Cl. 137-78.200.
Hashimoto, Kiyoyasu: *See*—
Yoshinaga, Kenji; Hashimoto, Kiyoyasu; Okaniwa, Tetsuo; and Kenmochi, Hirohito, 4,488,992, Cl. 534-788.000.
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Fujii, Setsuro; Hamakawa, Toshihiro; Ogawa, Kazuo; Muranaka, Yoshiyuki; and Hashimoto, Sadao, 4,489,091, Cl. 424-278.000.
Hashimoto, Shintaro; and Tanimoto, Akira, to Sharp Kabushiki Kaisha. Electronic dictionary and language interpreter with faculties of pronouncing of an input word or words repeatedly. 4,489,396, Cl. 364-900.000.
Hashimoto, Shintaro, to Sharp Kabushiki Kaisha. Programmable calculator with verbal indications of stored programs. 4,489,429, Cl. 381-51.000.
Hass, William H.: *See*—
Peterson, Richard H.; Bovenizer, Patrick J.; Jensen, Richard W.; and Hass, William H., 4,488,468, Cl. 84-1.010.
Hatada, Kenji; Miyajima, Osamu; and Kobayashi, Hiroaki, to Toray Industries, Inc. Method of treating inner surface of plastic tube with plasma. 4,488,954, Cl. 204-169.000.
Hatanaka, Isamu; Sekine, Takashi; and Yazawa, Kenichiro, to Fuji Photo Film Co., Ltd. Chemical analyzer. 4,488,810, Cl. 356-244.000.
Hatano, Yukihiko; and Takahashi, Tadashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Optical gate signal generating apparatus and thyristor converter apparatus including the same. 4,489,372, Cl. 363-54.000.
Hatebur Umformmaschinen AG: *See*—
Criblez, Roger; and Schoenenberger, Raymond, 4,488,420, Cl. 72-128.000.
Hattori, Torao: *See*—
Nishikawa, Masao; Hattori, Torao; Aoki, Takashi; and Yoshizawa, Hiroshi, 4,488,446, Cl. 74-330.000.
Haviv, Fortuna; and Kerdesky, Francis A. J., to Abbott Laboratories. [1-(2-Oxazolyl) or -(2-thiazolyl) hydrazino]alkyl nitriles. 4,489,084, Cl. 424-270.000.
Hawkins, Pamela L.; and Young, Carole J., to American Hospital Supply Corporation. Fresh blood (unfixed) hematology control. 4,489,162, Cl. 436-10.000.
Hayashi, Katsumi, to Lubrizol Corporation, The. Carboxylic acylating agents substituted with olefin polymers of high/low molecular weight mono-olefins, derivatives thereof, and fuels and lubricants containing same. 4,489,194, Cl. 525-193.000.
Hayatdavoudi, Asadollah; and Adams, Ladd M., to Petroleum Instrumentation & Technological Services. Separator sub with annular flow passage. 4,488,607, Cl. 175-65.000.
Haydon, Arthur W., deceased; and by Haydon, Jean F., executor. Magnetic switch. 4,489,297, Cl. 335-207.000.
Haydon, Jean F., executor: *See*—
Haydon, Arthur W., deceased; and Haydon, Jean F., executor, 4,489,297, Cl. 335-207.000.
Hayes, Charles L. Spring disconnect mechanism for self centering multiple axis analog control stick. 4,489,304, Cl. 338-128.000.
Hazue, Masaaki: *See*—
Azuma, Makoto; and Hazue, Masaaki, 4,489,053, Cl. 424-1.100.
Hedlund, Bengt G.: *See*—
Moren, Lars G.; Berg, Ulf P.; and Hedlund, Bengt G., 4,489,262, Cl. 318-700.000.
Heesch, Max O.; and Scholin, Harold G., to International Telephone and Telegraph Corporation. Seat belt anchoring apparatus. 4,488,754, Cl. 297-216.000.
Hefner, Robert E., Jr., to Dow Chemical Company, The. Process for preparing epoxy resins containing triazine groups. 4,489,202, Cl. 528-95.000.
Hegler, Ralph-Peter: *See*—
Hegler, Wilhelm; and Hegler, Ralph-Peter, 4,488,467, Cl. 83-303.000.
Hegler, Wilhelm; and Hegler, Ralph-Peter, to Hegler, Wilhelm. Apparatus for cutting openings in pipes. 4,488,467, Cl. 83-303.000.
Hehr, Herbert. Collapsible lightweight trailer. 4,488,735, Cl. 280-656.000.
Heideman, Robert C. Aeration/circulation method and apparatus utilizing low pressure air. 4,488,508, Cl. 119-3.000.
Heimann, Sigismund: *See*—
Fikentscher, Rolf; Fleischer, Herbert; Heimann, Sigismund; and Mertens, Heinrich, 4,488,879, Cl. 8-539.000.
Heinecke, Rudolf A. H.; Stern, Ronald C.; and Cooke, Michael J., to ITT Industries, Inc. Metallization plant. 4,488,506, Cl. 118-667.000.
Heit, Martin A.: *See*—
Vogt, Robert K.; and Heit, Martin A., 4,488,639, Cl. 198-787.000.
Helland, Per. External setting and correction device for the treatment of bone fractures. 4,488,542, Cl. 128-92.00A.
Hellers, Bo G., to Evak Sanitar AB. Sewage system for waste water. 4,488,963, Cl. 210-170.000.
Hellsten, Tord M., to Aktiebolaget Gyproc. Wheeled plate carrier. 4,488,733, Cl. 280-47.160.
Henderson, Herman O., Jr.: *See*—
Baugh, Benton F.; Henderson, Herman O., Jr.; Fowler, John H.; and Ahlstone, Arthur, 4,488,740, Cl. 285-84.000.
Henkel Kommanditgesellschaft auf Aktien: *See*—
Kluth, Hermann; Bachmann, Robert; and Boerner, Georg, 4,489,176, Cl. 521-144.000.
Heraeus Quarzschmelze GmbH: *See*—
Schulke, Karl A., 4,488,743, Cl. 285-368.000.
Herbst, LeRoy J.; and Preher, John L., to General Electric Company. Treating agent dispensing apparatus for a washing appliance. 4,488,666, Cl. 222-651.000.
Herlow, Erik: *See*—
Swett, James B.; and Herlow, Erik, 4,488,667, Cl. 222-485.000.
Hermann Berstorff Maschinenbau GmbH: *See*—
Brand, Wilhelm; Hersing, Hans; and Baasner, Dietmar, 4,488,465, Cl. 83-175.000.
Herndon, William H.: *See*—
Vora, Madhukar B.; and Herndon, William H., 4,488,350, Cl. 29-577.00C.
Herr, R. Wilbur: *See*—
Martin, Sylvia; and Herr, R. Wilbur, 4,488,942, Cl. 204-44.200.
Herron, Charles R.; Haines, Marvin L.; and O'Quinn, Roger L. Headlight permissible for use in explosive atmospheres. 4,489,367, Cl. 362-311.000.
Herrouin, Guy: *See*—
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Herschel, Ben B. Modular apparatus for laundry dryer heat recovery. 4,488,364, Cl. 34-86.000.
Hersing, Hans: *See*—
Brand, Wilhelm; Hersing, Hans; and Baasner, Dietmar, 4,488,465, Cl. 83-175.000.
Herud, Frank R., to Textron Inc. Process and apparatus for feeding particulate material into a pressure vessel. 4,488,838, Cl. 406-56.000.
Hestehave, Borge; and Hestehave, Kjeld, to Bomatic, Inc. Drainer container and funnel. 4,488,584, Cl. 141-339.000.
Hestehave, Kjeld: *See*—
Hestehave, Borge; and Hestehave, Kjeld, 4,488,584, Cl. 141-339.000.
Hewlett-Packard Company: *See*—
Jolly, Richard D., 4,488,348, Cl. 29-571.000.
Hickman, John B., to W. P. Hickman Co. Roof edge construction. 4,488,384, Cl. 52-60.000.
Hicks, Irwin A., to Singer Company, The. Thermally responsive slam shut valve assembly. 4,488,566, Cl. 137-74.000.
Hidaka, Kenjiro. Multibin sheet feeder for use with a printer. 4,488,829, Cl. 400-605.000.
Higgins, Larry, to Leggett & Platt, Incorporated. Longitudinally laced continuous coil spring assembly. 4,488,712, Cl. 267-91.000.
Higgs, Leonard C.: *See*—
Hunt, William V.; Coletta, John A.; Howling, Richard J.; and Higgs, Leonard C., 4,488,322, Cl. 5-453.000.
High Voltage Engineering Corporation: *See*—
Milde, Helmut I., 4,488,885, Cl. 55-139.000.
Higuchi, Takeru: *See*—
Himmelstein, Kenneth J.; and Higuchi, Takeru, 4,489,056, Cl. 424-22.000.
Hildebrand, Clair E.: *See*—
Wong, Franklin S.; and Hildebrand, Clair E., 4,489,041, Cl. 422-186.220.
Hilker, George D., to Phelps Dodge Magnet Wire Co. Magnet wire. 4,489,130, Cl. 428-378.000.
Hill, Anthony D.; Ford, David A.; Goulette, Michael J.; and Arthey, Roger P., to Rolls-Royce Limited. Single-crystal castings. 4,488,915, Cl. 148-404.000.
Hill, Ira D.; Trenkle, Robert W.; Mookherjee, Braja D.; and Wolff, Robin K., to International Flavors & Fragrances Inc. Process for augmenting or enhancing the fresh air aroma of consumable materials and clothing and composition useful for same. 4,488,973, Cl. 252-8.600.
Hille, Hans-Dieter: *See*—
Drexler, Hermann-Josef; Ebner, Franz; Hille, Hans-Dieter; and Roth, Ulrich, 4,489,135, Cl. 428-423.100.
Hillenbrand, Gary F.: *See*—
Sanders, Frederick W.; Hillenbrand, Gary F.; Arney, Jonathan S.; and Wright, Richard F., 4,489,151, Cl. 430-138.000.
Himmelstein, Kenneth J.; and Higuchi, Takeru, to Merck & Co., Inc. Acid anhydrides as rate contr. lling agent for the erosion of polymers which latter polymers have beneficial substances dispersed throughout their matrix or where the polymer matrix surrounds the beneficial substance. 4,489,056, Cl. 424-22.000.
Hinchliffe, Glenn S. Hydrodynamic skylight apparatus. 4,488,791, Cl. 350-582.000.
Hinkley, E. David, Jr.: *See*—
Grant, William B.; and Hinkley, E. David, Jr., 4,489,239, Cl. 250-339.000.
Hinton, Teresa L.; and Spamer, William S., to Mead Corporation, The. Merchandising display connector means. 4,488,652, Cl. 211-183.000.
Hirakawa, Tatsuo: *See*—
Sadaki, Hiroshi; Narita, Hirokazu; Imaizumi, Hiroyuki; Konishi, Yoshinori; Inaba, Takihiro; Hirakawa, Tatsuo; Taki, Hideo; Tai, Masaru; Watanabe, Yasuo; and Saikawa, Isamu, 4,489,072, Cl. 424-246.000.
Hirano, Shigeo: *See*—
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Hirao, Hiroshi: *See*—
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Hirata, Koichi: *See*—
Yoshimura, Motokazo; Takiguchi, Michitaka; Horie, Fujio; and Hirata, Koichi, 4,489,436, Cl. 381-51.000.
Hitachi Chemical Company, Ltd.: *See*—
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Hitachi, Ltd.: *See*—
Matsuda, Tadahito; Okubo, Tsuneo; Ozasa, Susumu; Saitou, Norio; and Yoda, Haruo, 4,489,241, Cl. 250-491.100.
Noguchi, Yoshiki, 4,488,398, Cl. 60-39.120.
Sato, Tetsuo, 4,489,285, Cl. 330-288.000.
Suehiro, Akio; and Ichikawa, Akira, 4,489,433, Cl. 381-41.000.
Takahashi, Ikuo, 4,488,526, Cl. 123-357.000.

Ho, Bryant K.: *See*—
Askin, Haluk O.; Ho, Bryant K.; and Rabbat, Guy, 4,489,417, Cl. 375-17.000.

Ho, Chung W.: *See*—
Chance, Dudley A.; Platt, Alan; Ho, Chung W.; and Ray, Sudipta K., 4,489,364, Cl. 361-395.000.

Ho, Nelson, to Critikon, Inc. AC Mode operation of chemfet devices. 4,488,556, Cl. 128-635.000.

Hochella, William A.: *See*—
Gust, Edward W.; Levendosky, Robert F.; and Hochella, William A., 4,488,356, Cl. 29-882.000.

Hockensmith, Richard P. Calendar with combined display of consecutive months. 4,488,366, Cl. 40-119.000.

Hocker, Jurgen; Dhein, Rolf; and Merten, Rudolf, to Bayer Aktiengesellschaft. Doped polymeric organic electrical conductors and a process for their manufacture. 4,488,987, Cl. 252-520.000.

Hodakowski, Leonard E., to Union Carbide Corporation. Enol-phosphorous esters of 2-aryl-1,3-cycloalkanediones compounds. 4,489,012, Cl. 260-946.000.

Hoechst Aktiengesellschaft: *See*—
Bernhardt, Heinrich, 4,488,880, Cl. 8-652.000.

Hoerlein, Francesca S. Combination scarf and puppet. 4,488,315, Cl. 2-91.000.

Hoffa, Robert J.; and Burde, Carl M., to Deere & Company. Radar ground speed sensing system. 4,489,321, Cl. 343-8.000.

Hoffmann, Hellmut, to Bayer Aktiengesellschaft. Preparation of α-oxo-α-(3-alkoxycarboxyl-2,2-dimethyl-cycloprop-1-yl)-methane-phosphonic acid esters. 4,489,013, Cl. 260-968.000.

Hoffmann-La Roche Inc.: *See*—
Hunkeler, Walter; and Kyburz, Emilio, 4,489,003, Cl. 260-239.30P.

Hoffmann, Rudolf; and Zajber, Adolf G., to Mannesmann Aktiengesellschaft. Continuous billet guide stand. 4,488,591, Cl. 164-442.000.

Hokkai Seikan Kabushiki Kaisha: *See*—
Homma, Yoshihiro, 4,488,661, Cl. 220-462.000.

Hollandse Signaalapparaten B.V.: *See*—
DeGroot, Gerrit; and Slag, Alexander H., 4,489,388, Cl. 364-517.000.

Hollenstein, Peter; and Lindenmann, Alois, to Schurter AG. Fuse holder for use with different line voltages. 4,489,300, Cl. 337-186.000.

Hollinger, William K., Jr. Archival container construction material. 4,489,120, Cl. 428-182.000.

Holmgren, Nils V.; and Martin, Donald R., to McGraw-Edison Company. Distribution class puffer interrupter. 4,489,226, Cl. 200-148.00A.

Holtrop, James S.; and Maurer, Richard P., to Monsanto Company. Thermoformable laminate structure. 4,489,126, Cl. 428-246.000.

Holub, Fred F.: *See*—
Harnden, John D., Jr.; Kornrumpf, William P.; and Holub, Fred F., 4,489,234, Cl. 219-347.000.

Holzmann, Dieter: *See*—
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Homeyer, Bernhard: *See*—
Maurer, Fritz; Hammann, Ingeborg; and Homeyer, Bernhard, 4,489,088, Cl. 424-273.00P.

Homma, Yoshihiro, to Hokkai Seikan Kabushiki Kaisha. Composite packing container. 4,488,661, Cl. 220-462.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Ishige, Yoshiki; Kinugasa, Toshiyuki; and Sato, Shoji, 4,489,119, Cl. 428-167.000.
Nishikawa, Masao; Hattori, Torao; Aoki, Takashi; and Yoshizawa, Hiroshi, 4,488,446, Cl. 74-330.000.
Nishimura, Sadanori; Ishikawa, Keiichi; and Shimada, Hiroyuki, 4,488,457, Cl. 74-868.000.

Honeywell Inc.: *See*—
Aske, Vernon H., 4,488,445, Cl. 73-517.00R.
Jungkman, David L.; Coda, Roger C.; and Nicholson, Peter N., 4,488,414, Cl. 62-514.00R.

Honeywell Information Systems Inc.: *See*—
Carey, Richard A.; and Falk, Jerry, 4,489,380, Cl. 364-200.000.

Hong, Sun-Nan; and Spector, Marshall L., to Air Products and Chemicals, Inc. Removal of phosphates and BOD from wastewaters. 4,488,968, Cl. 210-605.000.

Hong, Sun-Nan: *See*—
Block, Charles S.; and Hong, Sun-Nan, 4,488,967, Cl. 210-605.000.

Honig, Gunter: *See*—
Gast, Theodor; Binder, Kurt; and Honig, Gunter, 4,488,439, Cl. 73-861.180.

Honjo, Masahiro: *See*—
Kobayashi, Masaaki; Tomita, Masao; Matsumoto, Masayuki; Honjo, Masahiro; and Yamanishi, Kazuhiro, 4,489,352, Cl. 360-10.300.

Hoobler, Mary A.: *See*—
Sikorski, James A.; and Hoobler, Mary A., 4,488,894, Cl. 71-87.000.

Hooper, Leonard C., to Procter & Gamble Company, The. Apparatus for C-folding a covering web about a longitudinally flexible article. 4,488,927, Cl. 156-464.000.

Hooper, Mark W.; and Voorhees, Edward J., to Empak, Inc. Method for using salt deposits for storage. 4,488,834, Cl. 405-58.000.

Hooper, Sonne L.; and Setzer, Drel, to United States of America, National Aeronautics and Space Administration. Self-charging metering and dispensing device for fluids. 4,488,663, Cl. 222-43.000.

Hope, Peter: *See*—
Battey, Paul K.; and Hope, Peter, 4,488,985, Cl. 252-400.00A.

Hoppe, Joachim A.; and Simmons, Ralph L., to Schlumberger Technology Corporation. Pump-down stinger assembly method and apparatus. 4,488,597, Cl. 166-250.000.

Hopper, Albert C., Jr., to United States of America, Energy. Direct metal brazing to cermet feedthroughs. 4,488,673, Cl. 228-122.000.

Hoppough, Richard S.: *See*—
Walker, Herbert B.; and Hoppough, Richard S., 4,489,221, Cl. 179-19.000.

Hord, Charles F.; and Allen, William W., to Jensen Corporation. Hydraulic system for laundry flatwork ironer. 4,488,365, Cl. 38-47.000.

Horgan, Anthony M., to Xerox Corporation. Overcoated photoresponsive device. 4,489,148, Cl. 430-59.000.

Horie, Fujio: *See*—
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Horvath, Laszlo I.: *See*—
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Hosoe, Kazuya: *See*—
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Hosoya, Nobukaza, to Sanyo Electric Co., Ltd. Television image receiver provided with vertical synchronizing circuit count system. 4,489,343, Cl. 358-17.000.

Hou, Kenneth C., to AMF Incorporated. Fibrous media containing millimicron-sized particulates. 4,488,969, Cl. 210-679.000.

Howling, Richard J.: *See*—
Hunt, William V.; Coletta, John A.; Howling, Richard J.; and Higgs, Leonard C., 4,488,322, Cl. 5-453.000.

Howse, Eric R., to British Aerospace Public Limited Company. Door arrangements. 4,488,380, Cl. 49-279.000.

Hsieh, Der-Chang; and LaBudde, Edward V., to Burroughs Corporation. Optical memory system having a short seek capability. 4,489,406, Cl. 369-32.000.

Huber, Paul G.: *See*—
Baker, Lewin T.; and Huber, Paul G., 4,489,420, Cl. 375-94.000.

Hucker, David J.: *See*—
Glennon, Timothy F.; Hucker, David J.; and Lenny, Charles M., 4,489,323, Cl. 363-87.000.

Hueschen, Gordon W.: *See*—
Lepley, John A., 4,489,348, Cl. 358-149.000.

Hughes, Steve A., to National Data Corporation. Audio response system. 4,489,438, Cl. 381-51.000.

Hummel, Karl-Ernst: *See*—
Streich, Gerhard; and Hummel, Karl-Ernst, 4,488,627, Cl. 192-48.200.

Hummel, Werner: *See*—
Kluna, Vlastimil; and Hummel, Werner, 4,488,628, Cl. 192-58.00B.

Humphrey, Stanley A. Archery arrow having a collapsible tail assembly. 4,488,728, Cl. 273-423.000.

Hunkeler, Walter; and Kyburz, Emilio, to Hoffmann-La Roche Inc. Imidazobenzodiazepines. 4,489,003, Cl. 260-239.30P.

Hunt, Charles D'A., to Duval Corporation. Horizontal, multistage electron beam refinement of metals with recycle. 4,488,902, Cl. 75-10.00R.

Hunt, William V.; Coletta, John A.; Howling, Richard J.; and Higgs, Leonard C. Mattress and bed construction. 4,488,322, Cl. 5-453.000.

Hurley, James R.; and Gilker, Clyde, to McGraw-Edison Company. Electro-optical sensor for watt-hour meter. 4,489,384, Cl. 364-483.000.

Hurtig, Carl R., to Encor, Limited. Adjustable wrench. 4,488,461, Cl. 81-98.000.

Hutchins, Erle M.; and Schoenemann, William M., Jr., to AT&T Technologies, Inc. Methods of and apparatus for forming contact elements in a cord coupler housing. 4,488,355, Cl. 29-882.000.

Hyman, Richard M. Floating head toothbrush. 4,488,328, Cl. 15-167.00R.

Ichikawa, Akira: *See*—
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Ichinose, Kazuaki: *See*—
Saitoh, Shinji; Miyamoto, Junichi; and Ichinose, Kazuaki, 4,489,402, Cl. 365-200.000.

IGI Biotechnology, Inc.: *See*—
Milch, Robert A.; Guerry-Kopecko, Patricia; Koeble-Smith, Carol; and Sybert, Edward M., 4,488,912, Cl. 127-41.000.

Iida, Takashi; Ueyama, Masayuki; and Ishimura, Toshihiko, to Minolta Camera Kabushiki Kaisha. Automatic focusing device. 4,488,798, Cl. 354-402.000.

Iida, Tetsuya; and Sakaue, Tatsuo, to Kabushiki Kaisha Toshiba. D.C. Voltage bias circuit in an integrated circuit. 4,489,245, Cl. 307-296.00R.

Iida, Tetuo, to Tokyo Shibaura Denki Kabushiki. Tape Winding Machine. 4,488,685, Cl. 242-4.0BE.

Ikeda, Masaki; Amano, Tatsuyuki; and Tokuda, Kazuo, to Nippon Electric Co., Ltd. Signal processing unit. 4,489,344, Cl. 358-22.000.

Ikeda, Masashi; Tokumaru, Yukuya; Nakai, Masanori; and Ota, Masaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Integrated injection logic circuit with test pads on injector common line. 4,489,247, Cl. 307-477.000.
Ikeda, Tatsuji: *See*—
Nishida, Toshiaki; Okazaki, Kazuyuki; Kakumoto, Hideki; and Ikeda, Tatsuji, 4,488,529, Cl. 123-438.000.
Illinois Tool Works Inc.: *See*—
Achille, Jean R., 4,488,843, Cl. 411-41.000.
Rayburn, Charles C., 4,488,340, Cl. 29-25.420.
Imaizumi, Hiroyuki: *See*—
Sadaki, Hiroshi; Narita, Hirokazu; Imaizumi, Hiroyuki; Konishi, Yoshinori; Inaba, Takihiro; Hirakawa, Tatsuo; Taki, Hideo; Tai, Masaru; Watanabe, Yasuo; and Saikawa, Isamu, 4,489,072, Cl. 424-246.000.
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Hargreaves, Rodney B.; McLoughlin, Bernard J.; and Mills, Stuart D., 4,489,073, Cl. 424-246.000.
Imran, Mir, to Mirowski, Mieczyslaw. Battery condition warning system for medical implant. 4,488,555, Cl. 128-419.0PT.
Inaba, Hajimu; Sakakibara, Shinsuke; and Nihei, Ryo, to Fujitsu Fanuc Limited. Double hand with a through hole. 4,488,746, Cl. 294-86.00R.
Inaba, Takihiro: *See*—
Sadaki, Hiroshi; Narita, Hirokazu; Imaizumi, Hiroyuki; Konishi, Yoshinori; Inaba, Takihiro; Hirakawa, Tatsuo; Taki, Hideo; Tai, Masaru; Watanabe, Yasuo; and Saikawa, Isamu, 4,489,072, Cl. 424-246.000.
Inami, Mamoru; Ohtsuki, Zenju; and Tanaka, Yoshiaki, to Victor Company of Japan, Ltd. Maximum output level automatic measuring apparatus. 4,489,353, Cl. 360-25.000.
Industrial Technology Research Institute: *See*—
Lee, Ming-Kwang, 4,489,104, Cl. 427-101.000.
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von Au, Gunter; Innertsberger, Ernst; Schmidlkofer, Jakob; and Kaiser, Wolfgang, 4,489,201, Cl. 528-42.000.
Innova Wiener Innovationsgesellschaft m.b.H.: *See*—
Simbruner, Georg; and Rudelstorfer, Rudolf, 4,488,558, Cl. 128-642.000.
Innovations Foundation of the University of Toronto, The: *See*—
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Quecchia, Giorgio; and Cattaneo, Filippo, 4,488,421, Cl. 72-208.000.
Inoue, Hachiro. Method of excavating an under-reamed pile bore. 4,488,606, Cl. 175-57.000.
Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,488,962, Cl. 210-138.000.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Magnetic filtering apparatus. 4,488,962, Cl. 210-138.000.
Instance, David J. Method and apparatus for producing labels. 4,488,922, Cl. 156-192.000.
Institut Francais du Petrole: *See*—
Le Boucher, Bernard; and Sugier, Andre , 4,489,137, Cl. 428-610.000.
International Business Machines Corporation: *See*—
Askin, Haluk O.; Ho, Bryant K.; and Rabbat, Guy, 4,489,417, Cl. 375-17.000.
Barclay, Donald J.; and Bird, Colin L., 4,488,782, Cl. 350-357.000.
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Dixon, Jerry D.; Marazas, Gerald A.; McNeill, Andrew B.; and Merckel, Gerald U., 4,489,378, Cl. 364-200.000.
Ebert, William S.; Reynolds, Harold D.; Sjostrom, William J.; and Strollo, Robert R., 4,488,684, Cl. 239-222.000.
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Lavallee, Russell W.; Ryan, Philip M.; and Sollitto, Vincent F., Jr., 4,489,381, Cl. 364-200.000.
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International Coal Refining Company: *See*—
Ying, David H. S., 4,488,594, Cl. 165-163.000.
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Watson, Christopher A., 4,488,440, Cl. 73-861.770.
Iovine, Carmine P.: *See*—
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Isenberg, Gerry E.; Forshey, Terry L.; and Keller, Robert D., Jr., to Sperry Corporation. Treating ladle for ductile iron treatment. 4,488,711, Cl. 266-276.000.
Ishida, Kohji; Numata, Tatsuo; and Noguchi, Tadashi, to Pioneer Electronic Corporation. FM Stereo demodulation circuit. 4,489,430, Cl. 381-7.000.
Ishige, Yoshiki; Kinugasa, Toshiyuki; and Sato, Shoji, to Honda Giken Kogyo Kabushiki Kaisha. Laminated structure. 4,489,119, Cl. 428-167.000.
Ishiguru, Yukio; Takano, Hirotaka; and Funaki, Yuji, to Sumitomo Chemical Company, Limited. Fungicidal composition. 4,489,082, Cl. 424-269.000.
Ishikawa, Keiichi: *See*—
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Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
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Noguchi, Kosaku; Tanaka, Honami; Kumura, Yukimasa; Kitajima, Eiji; and Ishitobi, Toshifumi, 4,488,957, Cl. 208-40.000.
Ishizaki, Yasuhiro, to Mitsubishi Denki Kabushiki Kaisha. Power amplifier. 4,489,283, Cl. 330-268.000.
Iskander, Madgy F., to University of Utah. Apparatus and method for measuring lung water content. 4,488,559, Cl. 128-653.000.
Isobe, Toshinobu: *See*—
Tanaka, Yutaka; and Isobe, Toshinobu, 4,489,346, Cl. 358-31.000.
Itani, Takashi; Kozuki, Susumu; and Narasawa, Takashi, to Canon Kabushiki Kaisha. Color video camera. 4,489,345, Cl. 358-29.000.
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Sugiura, Kengo; Yamauchi, Yasutaka; and Ito, Hiroshi, 4,488,524, Cl. 123-339.000.
Ito, Shinzo, to Nippondenso Co., Ltd. Method and apparatus for measuring injection amount of fuel injector. 4,488,429, Cl. 73-119.00A.
Itoh, Kouichi, to Aisin Seiki Kabushiki Kaisha. Thermally responsive valve device. 4,488,680, Cl. 236-93.00A.
Itsubo, Junichi; and Oda, Hiroyuki, to Japan Crown Cork Co., Ltd. Plastic closure for containers. 4,488,655, Cl. 215-252.000.
ITT Industries, Inc.: *See*—
Gollinger, Wolfgang; Schat, Hermannus; Holzmann, Dieter; Elmis, Herbert; Struthoff, Holger; and Kunz, Detlev, 4,489,342, Cl. 358-17.000.
Heinecke, Rudolf A. H.; Stern, Ronald C.; and Cooke, Michael J., 4,488,506, Cl. 118-667.000.
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ITW de France: *See*—
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Iura, Yukio; Shimizu, Masami; Aizawa, Hiroshi; Tsunekawa, Tokuichi; Uchidoi, Masanori; and Yamamichi, Masayoshi, to Canon Kabushiki Kaisha. Photographing mode display device of a camera. 4,488,800, Cl. 354-445.000.
Ivins, Earl E.; and Ivins, John L., to Engineers Sales-Service Co., Inc. Submersible pump apparatus. 4,488,852, Cl. 417-211.500.
Ivins, John L.: *See*—
Ivins, Earl E.; and Ivins, John L., 4,488,852, Cl. 417-211.500.
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Wernimont, Theodore A., 4,488,850, Cl. 414-723.000.
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Alberts, Heinrich; Dahm, Manfred; Jabs, Gert; and Wegner, Christian, 4,489,017, Cl. 264-4.700.
Jackson, David A., Jr. Susceptors for organometallic vapor-phase epitaxial (OMVPE) method. 4,488,507, Cl. 118-726.000.
Jackson, William A.; and Kretchman, Gerald L., to Whirlpool Corporation. Combination idler and belt failure switch for a dryer. 4,488,363, Cl. 34-55.000.
Jacobs, Anthony S.; Riley, James E.; and Christman, Jon D., to Wessel Company, Inc., The. Combined key holder and booklet. 4,488,737, Cl. 281-31.000.
Jacobson, Chester F., to Gillette Company, The. Safety razor. 4,488,357, Cl. 30-57.000.
Jacobson Mfg. Co., Inc.: *See*—
Baubles, Richard C., 4,488,844, Cl. 411-85.000.
Jacobson, Walter E., to Revere Corporation of America. Load cell. 4,488,611, Cl. 177-211.000.
Jahnke, Frederick C.; and Muenger, James R., to Texaco Development Corp. Gas cooler for production of superheated steam. 4,488,513, Cl. 122-32.000.

James River-Dixie/Northern, Inc.: *See*—
Eber, Robert J.; and Janda, Bruce W., 4,488,932, Cl. 162-9.000.

Jamrus, Kenneth J., to General Electric Company. Apparatus for measuring friction of hydraulic control rod drives in nuclear reactors. 4,489,036, Cl. 376-229.000.

Janda, Bruce W.: *See*—
Eber, Robert J.; and Janda, Bruce W., 4,488,932, Cl. 162-9.000.

Japan Crown Cork Co., Ltd.: *See*—
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Jaulmes, Christian, to Ateliers de la Motobecane. Four-wheel vehicle. 4,488,617, Cl. 180-209.000.

Jenkins, Mary A. Ring with replaceable stones. 4,488,415, Cl. 63-29.00R.

Jensen Corporation: *See*—
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Jensen, Finn Q., to B&W Diesel A/S. Drive mechanism for a fuel pump of a reversible two-stroke engine. 4,488,452, Cl. 74-569.000.

Jensen, Richard W.: *See*—
Peterson, Richard H.; Bovenizer, Patrick J.; Jensen, Richard W.; and Hass, William H., 4,488,468, Cl. 84-1.010.

Jeong, Seo Y.: *See*—
Kim, Wan S.; Jeong, Seo Y.; and McRea, James C., 4,489,063, Cl. 424-178.000.
Kim, Wan S.; Jeong, Seo Y.; and McRea, James C., 4,489,064, Cl. 424-178.000.

Jett, William B., Jr., to National Semiconductor Corporation. CMOS Op amp bias circuit. 4,489,282, Cl. 330-261.000.

Jidosha Kiki Co., Ltd.: *See*—
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Jirovsky, Ivan; Jojko, Zorjan; Kokoska, Ivan; Prusek, Jaroslav; and Trojan, Vaclav, to Statni vyzkumny ustav ochrany materialu G.V. Akimova. Method and apparatus for coulometric measurement. 4,488,938, Cl. 204-1.00T.

Jiruse, Jaroslav; and Liska, Zbynek, to ZVS Adamovske strojirny koncernovy podnik. Control device for offset printing cylinders having adjustably mounted eccentric shaft. 4,488,484, Cl. 101-248.000.

Jiskoot Autocontrol Limited: *See*—
Jiskoot, Joost J., 4,488,570, Cl. 137-238.000.

Jiskoot, Joost J., to Jiskoot Autocontrol Limited. Bleeding apparatus and method. 4,488,570, Cl. 137-238.000.

Jofs, Jarl-Erik, to Oy Wiik & Hoglund AB. Non-slip plastic film. 4,488,918, Cl. 156-79.000.

Joh, Seiji: *See*—
Sunaga, Ryuzo; and Joh, Seiji, 4,488,802, Cl. 355-3.0CH.

Johnson, C. Erteszek, to Olga Company. Pantlegged garment with knee protection. 4,488,314, Cl. 2-23.000.

Johnson & Johnson Baby Products: *See*—
Flaska, Joseph M.; and Wittemann, Robert F., 4,488,668, Cl. 222-548.000.

Johnson, Leighton C., to Miles Laboratories, Inc. Apparatus for and method of optical absorbance and fluorescent radiation measurement. 4,488,814, Cl. 356-414.000.

Johnson, Peter D.; and Grubb, Willard T., to General Electric Company. High voltage, high current fuse with combustion assisted operation. 4,489,301, Cl. 337-401.000.

Johnson, Richard J. Portable cooking grill. 4,488,535, Cl. 126-25.00A.

Johnson, Thomas H., to Shell Oil Company. Tantalum (V) halide/oxide-metal oxide compositions and a process for their preparation. 4,489,171, Cl. 502-231.000.

Johnson, Thomas H., to Shell Oil Company. Process for preparing allyl- and 2-chloropropyl- or propenylarene compounds. 4,489,212, Cl. 568-628.000.

Johnson, Warren F.: *See*—
Savins, Joseph G.; and Johnson, Warren F., 4,489,042, Cl. 423-20.000.

Jojko, Zorjan: *See*—
Jirovsky, Ivan; Jojko, Zorjan; Kokoska, Ivan; Prusek, Jaroslav; and Trojan, Vaclav, 4,488,938, Cl. 204-1.00T.

Jolly, Richard D., to Hewlett-Packard Company. Method for making a self-aligned vertically stacked gate MOS device. 4,488,348, Cl. 29-571.000.

Jones, Faber B.: *See*—
Shue, Robert S.; and Jones, Faber B., 4,489,129, Cl. 428-366.000.

Jones, Gary L. Collapsible container. 4,488,659, Cl. 220-416.000.

Jones, Glenn C.; and Culver, Larry J., to Eastman Kodak Company. Coalescent-containing coating composition. 4,489,188, Cl. 524-292.000.

Jones, Huw O.: *See*—
Pooley, Frederick D.; Jones, Huw O.; and Wheatley, Barry I., 4,488,950, Cl. 204-116.000.

Jones, Kenneth J., to AE PLC. Pistons including inserts. 4,488,522, Cl. 123-193.0CP.

Jones, Marvin R., to Jones, Marvin R. Valve apparatus. 4,488,703, Cl. 251-77.000.

Jones, William B., Jr., to General Electric Company. Pulse pumping an optically pumped laser. 4,489,415, Cl. 372-38.000.

Jones, William C., to Seal Tech Corp. Apparatus for cutting sheet material. 4,488,466, Cl. 83-175.000.

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Wolf, Theodore L.; Rossman, John A.; Quinn, Russell C.; and Kish, Thomas J., 4,488,422, Cl. 72-377.000.

Joseph, Stephen H.; Miller, John E.; and Williamson, Lawrie A., to National Research Development Corporation. Method and apparatus for producing multi-layer expanded films. 4,488,860, Cl. 425-131.100.

Joshi, Sharad G., to Research Corporation. Monitoring of human endometrial function by radioimmunoassay of PEP. 4,489,166, Cl. 436-510.000.

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Ramming, John E., 4,488,441, Cl. 73-862.040.

Judat, Helmut; Schnegg, Ulrich; and Wedemeyer, Karlfried, to Bayer Aktiengesellschaft. Process for the halogenation of organic compounds. 4,489,210, Cl. 568-779.000.

Judge, Gregory R.: *See*—
Morgan, Steven J.; Lauyans, Frank M.; and Judge, Gregory R., 4,488,638, Cl. 198-781.000.

Julius Blum Gesellschaft m.b.H.: *See*—
Rock, Erich, 4,488,762, Cl. 312-348.000.

Jungkman, David L.; Coda, Roger C.; and Nicholson, Peter N., to Honeywell Inc. Disc detector assembly. 4,488,414, Cl. 62-514.00R.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
Mizokawa, Takumi; and Suzuki, Fumitaka, 4,488,837, Cl. 406-34.000.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Suzuki, Masaru, 4,489,359, Cl. 361-172.000.

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Kohara, Yuji, 4,488,483, Cl. 101-178.000.

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Iida, Tetsuya; and Sakaue, Tatsuo, 4,489,245, Cl. 307-296.00R.

Kagayama, Joe, to Tsuyama Mfg. Co. Side reflector assembly. 4,488,774, Cl. 350-99.000.

Kahlen, Hans; and Angelis, Jurgen, to Brown, Boveri & Cie, AG. Propulsion system for vehicles with a d-c machine. 4,489,258, Cl. 318-317.000.

Kaiser Aluminum & Chemical Corporation: *See*—
Perry, Robert E.; and Myers, William T., Jr., 4,488,833, Cl. 404-35.000.

Kaiser, Wolfgang: *See*—
von Au, Gunter; Innertsberger, Ernst; Schmidlkofer, Jakob; and Kaiser, Wolfgang, 4,489,201, Cl. 528-42.000.

Kajita, Yoshihiro: *See*—
Ochi, Yukio; Hachiya, Takashi; Miyazaki, Tadayoshi; and Kajita, Yoshihiro, 4,489,167, Cl. 436-518.000.

Kajitsuka, Senri, to Taikisha Ltd. Cooling method and system therefor. 4,488,408, Cl. 62-113.000.

Kakumoto, Hideki: *See*—
Nishida, Toshiaki; Okazaki, Kazuyuki; Kakumoto, Hideki; and Ikeda, Tatsuji, 4,488,529, Cl. 123-438.000.

Kalt, Andrew S.; and Kalt, Charles G. Capacitively coupled electrostatic device. 4,488,784, Cl. 350-359.000.

Kalt, Charles G.: *See*—
Kalt, Andrew S.; and Kalt, Charles G., 4,488,784, Cl. 350-359.000.

Kammin, Marvin R.; and Russell, Terrance J., to Minnesota Mining and Manufacturing Company. Transparencies for electrostatic printing. 4,489,122, Cl. 428-212.000.

Kampf, Richard S., to Beckman Instruments, Inc. Apparatus for transporting sample holders. 4,488,633, Cl. 198-472.000.

Kanzaki Paper Manufacturing Co., Ltd.: *See*—
Aoyagi, Shoji; and Shiraishi, Tetsuo, 4,489,336, Cl. 346-209.000.

Kaplan, Morris, to Nalco Chemical Company. Self-dispersing antimony oxide sols. 4,488,984, Cl. 252-313.00R.

Karickhoff, Michael, to Sherwin-Williams Company, The. Vesiculated beads. 4,489,174, Cl. 521-54.000.

Karlo, Rudolph A.: *See*—
Claassen, George B.; Karlo, Rudolph A.; and Zimmerman, William B., 4,488,893, Cl. 65-287.000.

Karmyshin, Nikolai V.; Kudryashov, Evgeny I.; Orlov, Vladimir M.; Levashov, Vladimir M.; Khorin, Vladimir N.; and Antonov, Alexandr D., to Gosudarstvenny Proektno -Konstruktorsky I Eksperimentalny Institut Ugolnoi Promyshlennosti. Plough mining installation. 4,488,757, Cl. 299-32.000.

Kasai, Kazumi, to Nippon Notion Kogyo Co., Ltd. Buckle assembly. 4,488,339, Cl. 24-575.000.

Kaster, Robert L. Prosthetic heart valve. 4,488,318, Cl. 3-1.500.

Kastl, Hans; Bauer, Rainer; and Modlich, Erich, to Kraftwerk Union Aktiengesellschaft. Analysis manipulator for non-destructive material testing, and method for controlling the coordinates thereof. 4,488,435, Cl. 73-618.000.

Kato, Kotaro: *See*—
Ueda, Jun; Mori, Haruo; Hagimura, Kazuo; Tsukada, Hirokazu; and Kato, Kotaro, 4,489,340, Cl. 357-38.000.

Kato, Yasuo, to Dai Nippon Insatsu Kabushiki Kaisha. Print inspecting device. 4,488,808, Cl. 356-73.000.

Katsumata, Ryoichi; Oka, Tetsuo; and Furuya, Akira, to Kyowa Hakko Kogyo Co., Ltd. Plasmid pCG2. 4,489,160, Cl. 435-253.000.

Kaun, Thomas D.: *See*—
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Kawagoe, Michio: *See*—
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Kawahara, Steven K.; and Peterson, James G., to TRW Inc. Monolithic discrete-time digital convolution circuit. 4,489,393, Cl. 364-728.000.

Kawamura, Shuji: *See*—
Fukuichi, Takuro; Kusumoto, Yasuo; Fujita, Sumio; and Kawamura, Shuji, 4,489,437, Cl. 381-51.000.

Kawamura, Takao; and Yoshida, Masazumi, to Minolta Camera Kabushiki Kaisha; Takao Kawamura; and Kyocera Corporation. Electrophotographic amorphous silicon member. 4,489,149, Cl. 430-65.000.

Kawasaki, Kiyohito: *See*—
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Kawneer Company, Inc.: *See*—
Symon, Ernest B., 4,488,378, Cl. 49-141.000.
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Parenti, Ronald R.; and Keicher, William E., 4,489,390, Cl. 364-724.000.
Keil, Karl-Heinz; Greiner, Ulrich; Eckardt, Georg-Wolfgang; and Kohler, Volker, to Cassella Aktiengesellschaft. Softener emulsion, a process for its preparation, and its application. 4,488,974, Cl. 252-8.800.
Keiper U.S.A. Inc.: *See*—
Ligensa, Karl-Heinz G.; and Cherdron, Philip, 4,488,451, Cl. 74-553.000.
Keller, Robert D., Jr.: *See*—
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Bennett, David E.; and Driear, Joseph R., 4,488,325, Cl. 14-71.300.
Kelley, Eugene W.: *See*—
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Kelly, Joseph D.: *See*—
Duffer, Paul F.; Franz, Helmut; and Kelly, Joseph D., 4,489,106, Cl. 427-154.000.
Kelly, Vincent M. Orthodontic lingual face bow. 4,488,872, Cl. 433-5.000.
Kendall, Debra L.: *See*—
Butler, James R.; Kendall, Debra L.; Forward, Cleve H.; Watson, James M.; and Branum, Gary D., 4,489,214, Cl. 585-467.000.
Kendziorski, John F. Firewood quartering splitter wedge. 4,488,585, Cl. 144-193.00D.
Kenmochi, Hirohito: *See*—
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Kenney, George C., to North American Philips Corporation. Electromagnetically deflectable device. 4,488,789, Cl. 350-486.000.
Keogh, Michael J.; Wallace, Scott L.; and Brown, Geoffrey D., to Union Carbide Corporation. Compositions based on alkylene-alkyl acrylate copolymers and silanol condensation catalysts; and the use thereof in the production of covered wires and cables. 4,489,029, Cl. 264-174.000.
Kerdesky, Francis A. J.: *See*—
Haviv, Fortuna; and Kerdesky, Francis A. J., 4,489,084, Cl. 424-270.000.
Kernick, Andress, to Westinghouse Electric Corp. Synthesized sine-wave static generator. 4,489,371, Cl. 363-41.000.
Kerotest Manufacturing Corp.: *See*—
Conley, Richard W.; and Tremblay, Richard P., 4,488,741, Cl. 285-250.000.
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Bowerman, Paul D.; Clapper, Thomas W.; and Laughlin, William C., 4,489,043, Cl. 423-49.000.
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KEURO Maschinenbau Gesellschaft mit beschrankter Haftung & Co. Kommanditgesellschaft: *See*—
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Khanna, Pyare; Snyder, Evan S.; and Singh, Prithipal, to Syva Company. Chloramphenicol derivatives. 4,489,156, Cl. 435-7.000.
Khanna, Pyare L.; Snyder, Evan S.; and Singh, Prithipal, to Syva Company. Chloramphenicol derivatives. 4,489,157, Cl. 435-7.000.
Khorin, Vladimir N.: *See*—
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Kiguchi, Majime, to Tokyo Shibaura Denki Kabushiki Kaisha. Disk reproducing apparatus. 4,489,407, Cl. 369-77.200.
Kikuchi, Minoru: *See*—
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Kilius, Linas R.: *See*—
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Kim, Wan S.; Jeong, Seo Y.; and McRea, James C. Glycosylated insulin derivatives. 4,489,063, Cl. 424-178.000.
Kim, Wan S.; Jeong, Seo Y.; and McRea, James C. Glycosylated insulin derivatives. 4,489,064, Cl. 424-178.000.
Kimberley, John A.; and Cavanaugh, John B., to AMBAC Industries, Incorporated. Mounting arrangement for injection barrel in housing of fuel injection pump. 4,488,857, Cl. 417-490.000.
Kimberly-Clark Corporation: *See*—
Ali Khan, Mir I.; and Schmidt, Richard J., 4,488,928, Cl. 156-495.000.
Endres, Dan D.; and Matray, Attila, 4,489,118, Cl. 428-154.000.
Kimura, Kenji, to Olympus Optical Co., Ltd. Solid-state image pickup device. 4,489,350, Cl. 358-213.000.
Kinast, Gunther; Boberg, Michael; Metzger, Karl G.; and Zeiler, Hans-Joachim, to Bayer Aktiengesellschaft. Cephalosporins. 4,489,076, Cl. 424-246.000.
Kingston, Samuel B.: *See*—
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Kino Precision Industries, Ltd.: *See*—
Osawa, Masami, 4,488,787, Cl. 350-429.000.
Kinshofer, Alfred. Locking device for attaching implements to convertible machines. 4,488,832, Cl. 403-316.000.
Kinugasa, Toshiyuki: *See*—
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Kish, Thomas J.: *See*—
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Kishida, Hajime, to Yamaha Hatsudoki Kabushiki Kaishi. Intake system for four-cycle engines. 4,488,519, Cl. 123-52.00M.
Kissel, Roland: *See*—
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Kissinger, Curtis; and Dorman, Richard, to Mechanical Technology Incorporated. Reflectivity compensating system for fiber optic sensor employing dual probes at a fixed gap differential. 4,488,813, Cl. 356-375.000.
Kitaguchi, Shuichi: *See*—
Mototsuna, Kazumichi; Fujitani, Takashi; Okumura, Yoshito; Nemoto, Iwao; and Kitaguchi, Shuichi, 4,488,500, Cl. 114-74.00A.
Kitajima, Eiji: *See*—
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Kitamura, Hiroaki, to Mitsubishi Denki Kabushiki Kaisha. Horizontally compact substation. 4,489,361, Cl. 361-333.000.
Klamut, Carl J.: *See*—
Suenaga, Masaki; Klamut, Carl J.; and Luhman, Thomas S., 4,489,219, Cl. 174-128.00S.
Klein, Elias; Wathen, Ronald L.; Ward, Richard A.; Cosentino, Louis C.; Fuller, Larry E.; and Martinez, Felix J., to Renal Systems, Inc. Percutaneous implant for peritoneal dialysis. 4,488,877, Cl. 604-175.000.
Kleinschmidt, Ernst: *See*—
Wanninger, Paul; and Kleinschmidt, Ernst, 4,488,916, Cl. 149-2.000.
Kling, Gunter, to Daimler-Benz AG. Lateral protection for motor vehicles. 4,488,751, Cl. 296-146.000.
Klopfer, Henry E., to Raychem Corporation. Shield connection device. 4,489,217, Cl. 174-35.00C.
Klucker, Klaus, to O & K Orenstein & Koppel Aktiengesellschaft. Power shovel. 4,488,849, Cl. 414-566.000.
Kluge, Fritz: *See*—
Auer, Peter; Kluge, Fritz; Lieske, Helmut; and Wutzler, Host, 4,489,024, Cl. 264-71.000.
Kluna, Vlastimil; and Hummel, Werner, to Sueddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG. Fluid friction clutch with actuator. 4,488,628, Cl. 192-58.00B.
Kluth, Hermann; Bachmann, Robert; and Boerner, Georg, to Henkel Kommanditgesellschaft auf Aktien. Polyurethane compositions useful as adhesives for insulation materials and/or facings. 4,489,176, Cl. 521-144.000.
Knipstein, Richard A.: *See*—
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Koa Oil Company, Ltd.: *See*—
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Kobayashi, Hiroaki: *See*—
Hatada, Kenji; Miyajima, Osamu; and Kobayashi, Hiroaki, 4,488,954, Cl. 204-169.000.
Kobayashi, Hisashi; and Snyder, William J., to Union Carbide Corporation. Cooling system for post-mixed burner. 4,488,682, Cl. 239-132.300.
Kobayashi, Masaaki; Tomita, Masao; Matsumoto, Masayuki; Honjo, Masahiro; and Yamanishi, Kazuhiro, to Matsushita Electric Industrial Co., Ltd. Video tape recording/reproducing apparatus having an auto tracking function. 4,489,352, Cl. 360-10.300.
Kobelt, Jacob. Mounting assembly for fluid actuated components and method for connecting said components thereto. 4,488,343, Cl. 29-157.10R.
Kocks Technik GmbH & Co.: *See*—
Quambusch, Albert; and Schoneberg, Wilfried, 4,488,419, Cl. 72-95.000.
Koe, Kiyohiko, to Sumitomo Electric Industries, Ltd. Process for producing circular gallium arsenide wafer. 4,488,930, Cl. 156-616.00R.
Koeble-Smith, Carol: *See*—
Milch, Robert A.; Guerry-Kopecko, Patricia; Koeble-Smith, Carol; and Sybert, Edward M., 4,488,912, Cl. 127-41.000.
Koenig & Bauer Aktiengesellschaft: *See*—
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Koford, Stuart K., to Allied Corporation. Fluorosilicone elastomers, method of making such elastomers and electrical connectors including the elastomers. 4,488,771, Cl. 339-278.00D.
Koh-I-Noor Rapidograph, Inc.: *See*—
Anderka, Gerold; Brandt, Joachim; DeBlitz, Gerhard; Martens, Rolf; Paschen, Rolf; Post, Jurgen; and Willimczik, Bernd, 4,489,333, Cl. 346-139.00R.
Kohara, Yuji, to Kabushiki Kaisha Tokyo Kikai Seisakusho. Multicolor rotary printing press. 4,488,483, Cl. 101-178.000.
Kohashi, Tadao, to Matsushita Electric Industrial Co., Ltd. Display device having juxtaposed capillary openings for generating variable surface concavities. 4,488,785, Cl. 350-360.000.

Kohler, Gernot: *See*—
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Kohler, Volker: *See*—
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Koike, Shyouichi, to Nissan Motor Company, Limited. Vehicles for effecting a seal. 4,488,753, Cl. 296-201.000.
Koinuma, Tokuju; Tashiro, Norio; and Yamamoto, Kaizo, to Tokyo Shibaura Denki Kabushiki Kaisha; and Nippon Hoso Kyokai. Magnetron. 4,489,254, Cl. 315-39.510.
Kojima, Nobuyuki; and Sekigawa, Youichi, to Toshiba Heating Appliances Co., Ltd. Warm air blowing heater. 4,488,536, Cl. 126-96.000.
Kojima, Tadashi: *See*—
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Kokoska, Ivan: *See*—
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Konersmann, Erhard, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Cutter apparatus. 4,488,381, Cl. 51-98.00R.
Konishi, Yoshinori: *See*—
Sadaki, Hiroshi; Narita, Hirokazu; Imaizumi, Hiroyuki; Konishi, Yoshinori; Inaba, Takihiro; Hirakawa, Tatsuo; Taki, Hideo; Tai, Masaru; Watanabe, Yasuo; and Saikawa, Isamu, 4,489,072, Cl. 424-246.000.
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Konishiroku Photo Industry Co. Ltd.: *See*—
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Kono, Kazuhiko. Manhole cover lifting hook. 4,488,706, Cl. 254-131.000.
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Jonner, Wolf-Dieter; Korasiak, Wolfgang; and Leiber, Heinz, 4,489,382, Cl. 364-426.000.
Kornberg, Roger D., to Leland Stanford Jr. University, The Board of Trustees of the. Two-dimensional crystallization technique. 4,489,133, Cl. 428-408.000.
Kornrumpf, William P.: *See*—
Harnden, John D., Jr.; Kornrumpf, William P.; and Holub, Fred F., 4,489,234, Cl. 219-347.000.
Kosmal, Brian A.; and Auld, Frederick W., to United States of America, Air Force. Pneumatic clamping device. 4,488,713, Cl. 269-25.000.
Kosugi, Masao: *See*—
Takahashi, Kazuo; Sato, Hiroshi; and Kosugi, Masao, 4,488,806, Cl. 355-77.000.
Kouno, Yasuo: *See*—
Uda, Naotake; Kouno, Yasuo; and Shiomura, Tadayoshi, 4,489,033, Cl. 264-328.700.
Kovach, Stephen M., to Ashland Oil, Inc. Alumina catalyst for alkylating aromatics with olefins. 4,489,213, Cl. 585-467.000.
Kowalik, Ralph M.: *See*—
Lundberg, Robert D.; Peiffer, Dennis G.; Duvdevani, Ilan; and Kowalik, Ralph M., 4,489,180, Cl. 523-175.000.
Koziol, Walter. Dual adjustable gas intake assembly. 4,488,534, Cl. 126-25.00R.
Kozuki, Susumu: *See*—
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Krabetz, Richard; and Schwarzmann, Matthias, to BASF Aktiengesellschaft. Oxidation catalyst, especially for the preparation of methacrylic acid by gas phase oxidation of methacrolein. 4,489,170, Cl. 502-211.000.
Kraft, Donald L.: *See*—
Smith, Ernest L.; and Kraft, Donald L., 4,488,658, Cl. 220-276.000.
Kraft, Thomas L.; Vick, Howard A.; and Meador, James W., to American Home Products Corporation. Photometric apparatus. 4,488,812, Cl. 356-338.000.
Kraftwerk Union Aktiengesellschaft: *See*—
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Krahler, Stanley E., to Du Pont de Nemours, E. I., and Company. Iodopentahydroperfluoroalkyl borates. 4,489,006, Cl. 260-462.00R.
Kraicar, Heinz; and Ziegler, Alfred, to Siemens Aktiengesellschaft. Circuit for automatically closing a backup remote feed loop. 4,489,360, Cl. 361-187.000.
Kratt, Henry J. Mooring device. 4,488,501, Cl. 114-230.000.
Kress Corporation: *See*—
Kress, Edward S.; Thomas, Dennis R.; and LaBerdia, William L., 4,488,848, Cl. 414-460.000.
Kress, Edward S.; Thomas, Dennis R.; and LaBerdia, William L., to Kress Corporation. Load handling apparatus. 4,488,848, Cl. 414-460.000.
Kretchman, Gerald L.: *See*—
Jackson, William A.; and Kretchman, Gerald L., 4,488,363, Cl. 34-55.000.
Kretschmer, Frank F.: *See*—
Lewis, Bernard L.; and Kretschmer, Frank F., 4,489,320, Cl. 343-7.700.
Kriebel, John E., to Capital Controls Company, Inc. Apparatus for diffusing gases into liquids. 4,489,016, Cl. 261-122.000.
Krieg, Donald J., to Mobil Oil Corporation. Method of sealing laminar thermoplastic films and bags. 4,488,924, Cl. 156-251.000.
Kronenberg, Stanley; McLaughlin, William L.; and Siebentritt, Carl R. Radiochromic leuko dye real time dosimeter, one way optical waveguide. 4,489,240, Cl. 250-474.100.
Krupp-Koppers GmbH: *See*—
Preusser, Gerhard; Richter, Klaus; and Schulze, Martin, 4,488,936, Cl. 203-1.000.
Krupp Polysius AG: *See*—
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Kuch, Philip L., to Standard Oil Company (Ohio), The. Process for producing hydrogen and carbonyl sulfide from hydrogen sulfide and carbon monoxide using a heteropolyanionic metal complex catalyst. 4,489,048, Cl. 423-416.000.
Kudryashov, Evgeny I.: *See*—
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Kumaki, Takashi: *See*—
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Kumano, Shinji; and Kondo, Masao, to Nippon Gakki Seizo Kabushiki Kaisha. Keyboard musical instrument. 4,488,472, Cl. 84-434.000.
Kumura, Yukimasa: *See*—
Noguchi, Kosaku; Tanaka, Honami; Kumura, Yukimasa; Kitajima, Eiji; and Ishitobi, Toshifumi, 4,488,957, Cl. 208-40.000.
Kunz, Detlev: *See*—
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Kuroki, Kazuo, to Fuji Electric Company, Ltd. Variable-frequency oscillator having a crystal oscillator. 4,489,279, Cl. 328-134.000.
Kurtz, Bruce E.: *See*—
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Kusumoto, Yasuo: *See*—
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Kuzsetsov, Stephen B., to Westinghouse Electric Corp. Electric machine with continuous pole phase modulation. 4,489,265, Cl. 318-773.000.
Kyburz, Emilio: *See*—
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Kyocera Corporation: *See*—
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Kyowa Hakko Kogyo Co., Ltd.: *See*—
Katsumata, Ryoichi; Oka, Tetsuo; and Furuya, Akira, 4,489,160, Cl. 435-253.000.
La Telemecanique Electrique: *See*—
Guery, Jean-Pierre; and Zwarycz, Andre , 4,489,296, Cl. 335-197.000.
LaBerdia, William L.: *See*—
Kress, Edward S.; Thomas, Dennis R.; and LaBerdia, William L., 4,488,848, Cl. 414-460.000.
Laboratories L. Lafon: *See*—
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LaBudde, Edward V.: *See*—
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Lackenbach, Elliot A., to Singer Company, The. Power spray nozzle with fluidic oscillator. 4,488,329, Cl. 15-322.000.
LaConti, Anthony B.: *See*—
Nolan, Mary E.; and LaConti, Anthony B., 4,488,951, Cl. 204-129.000.
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Lafont, Andre ; Rabier, Michel; Guedon, Michel; and Herrouin, Guy, to Societe D'Etudes et de Developpement des Aeroglisseurs Marins, Terrestres et Amphibies (SEDAM). Air-cushion vehicles. 4,488,614, Cl. 180-127.000.
LaGrow, Alfred C. Recreational device for impelling an object. 4,488,723, Cl. 273-129.00T.
Lam, Roger K. Board game having rock, scissors, paper type theme. 4,488,727, Cl. 273-236.000.
Lamarche, Fredrick W., to Sheldahl, Inc. Back lighted, full travel push button membrane keyboard. 4,489,227, Cl. 200-314.000.
Lamb, David E.; Long, William B.; and Sacco, William J. Method and apparatus for coordinating medical procedures. 4,489,387, Cl. 364-514.000.
Lamb, Glentworth; and Calora, Feliciano B., to American Cyanamid Company. Methods and compositions for the selective control of undesirable weed species in the presence of wet-land crops. 4,488,896, Cl. 71-92.000.
Lamberti, Vincent, to Lever Brothers Company. Aqueous compositions containing urea as a hydrotrope. 4,488,989, Cl. 252-541.000.
Lang, Stephen P.; Martin, Yolanda E.; Pinkston, Patrick E.; and Rao, Kanaparty N., to Deere & Company. Monitor for hydraulic transmission. 4,489,305, Cl. 340-57.000.
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Lanier, Charles S.; Maxwell, Hiram M.; McKay, Roger E.; and Weiss, Leonard, to International Business Machines Corporation. Distributed data processing in ring-structured networks architected for full duplex peer-to-peer operation of processing stations and uninterruptible transfer of long data records between stations. 4,489,379, Cl. 364-200.000.

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Antal, Sandor; Smaroglay, Peter; and Lantos, Elemer, 4,489,021, Cl. 264-27.000.

Lapeyre, James M. Rolling diaphragm metering valve. 4,488,702, Cl. 251-46.000.

Laran, Roy J., to Ethyl Corporation. Synthesis of complex beryllium hydrides. 4,489,051, Cl. 423-644.000.

Larrain, James A. Drum sticks. 4,488,470, Cl. 84-422.00S.

Larson, Eric H.; Kurtz, Bruce E.; and Fitch, Robert H., to Dow Chemical Company, The. Channel flow cathode assembly and electrolyzer. 4,488,948, Cl. 204-98.000.

Larsson, Peter L.; and Brorson, John-Erik B., to AB Centor SA. Arrangement to make possible the supply of material to receptacles and means therefore. 4,488,583, Cl. 141-311.00R.

Lasky, John C.: *See*—
von Gnechten, Lawrence A.; Byrnes, Thomas E.; and Lasky, John C., 4,488,675, Cl. 229-33.000.

Laughlin, William C.: *See*—
Bowerman, Paul D.; Clapper, Thomas W.; and Laughlin, William C., 4,489,043, Cl. 423-49.000.

Laurent, Francois. Method and installation for improving the efficiency of a submerged-combustion heating installation. 4,488,537, Cl. 126-360.00A.

Lauyans, Frank M.: *See*—
Morgan, Steven J.; Lauyans, Frank M.; and Judge, Gregory R., 4,488,638, Cl. 198-781.000.

Lavallee, Russell W.; Ryan, Philip M.; and Sollitto, Vincent F., Jr., to International Business Machines Corporation. Hierarchical memories having two ports at each subordinate memory level. 4,489,381, Cl. 364-200.000.

Lay, George E.; Haigh, Daniel H.; and Knipstein, Richard A., to Dow Chemical Company, The. Acne control method. 4,489,058, Cl. 424-78.000.

Layman, Bruce W.; and Privett, Billy G., to SuperTurf, Inc. Synthetic turf seam system. 4,489,115, Cl. 428-62.000.

Lear Siegler, Inc.: *See*—
Misson, Donald A., 4,488,359, Cl. 33-179.50C.

Le Boucher, Bernard; and Sugier, Andre , to Institut Francais du Petrole. Process for increasing the resistance to cracking corrosion of elongate elements such as armorings of flexible pipes or cables and the resultant products. 4,489,137, Cl. 428-610.000.

Lee, Alan J. C.; and Ling, Robin S. M., to University of Exeter. Pressurization of cement in bones. 4,488,549, Cl. 128-303.00R.

Lee, Fred S., to Magnex Corporation. Method of making a thin film magnetic head. 4,489,105, Cl. 427-123.000.

Lee, John M.; and Bauman, William C., to Dow Chemical Company, The. Removal of sulfate ions from brine. 4,488,949, Cl. 521-28.000.

Lee, Kin H., to Burroughs Corporation. Chain configurable polycellular wafer scale integrated circuit. 4,489,397, Cl. 364-900.000.

Lee, Ming-Kwang, to Industrial Technology Research Institute. Polycrystalline silicon resistor having limited lateral diffusion. 4,489,104, Cl. 427-101.000.

Leeman, Susan E.: *See*—
Rossini, Aldo A.; Mordes, John P.; Leeman, Susan E.; Carraway, Robert E.; and Ruane, Susan E., 4,489,059, Cl. 424-106.000.

Leeper, Alan L., to J. C. Pitman Company, Inc. Continuous fryer for potato chips and other snack foods. 4,488,478, Cl. 99-330.000.

le Faou, Daniel: *See*—
Beyl, Jean J. A.; Bernard, Jean; Campillo, Christian; Guerreau, Rene ; le Faou, Daniel; and Peyre, Henri, 4,488,734, Cl. 280-605.000.

Leggett, Archie L., Jr. Diskette punch with attached gage. 4,488,358, Cl. 30-363.000.

Leggett & Platt, Incorporated: *See*—
Higgins, Larry, 4,488,712, Cl. 267-91.000.

Lehman, Lewis M.; and Gribble, Joseph J., to Square D Company. Rejection type fuse holder. 4,488,767, Cl. 339-91.00R.

Lehmann, Heinz; Rossaik, Heinz; and Blumenthal, Reinhard, to Veb Kombinat Fortschritt Landmaschinen Neustadt in Sachsen. Chassis for self-propelled agricultural machine. 4,488,732, Cl. 280-781.000.

Leiber, Heinz: *See*—
Jonner, Wolf-Dieter; Korasiak, Wolfgang; and Leiber, Heinz, 4,489,382, Cl. 364-426.000.

Leigh-Monstevens, Keith V., to Automotive Products Plc. Quick connect cylinder mount structure. 4,488,701, Cl. 248-637.000.

Leland Stanford Jr. University, The Board of Trustees of the: *See*—
Kornberg, Roger D., 4,489,133, Cl. 428-408.000.

Leland Stanford, Junior University, The Board of Trustees of the: *See*—
Lusignan, Bruce B.; and Najafi, Hamid, 4,489,222, Cl. 177-170.200.

Lemelson, Jerome H. Weapon control system and method. 4,488,370, Cl. 42-70.00R.

Lenard, Peter: *See*—
Beck, Ernst; and Lenard, Peter, 4,488,458, Cl. 76-77.000.

Lenny, Charles M.: *See*—
Glennon, Timothy F.; Hucker, David J.; and Lenny, Charles M., 4,489,323, Cl. 363-87.000.

Lepley, John A., to Hueschen, Gordon W. Video camera synchronizer. 4,489,348, Cl. 358-149.000.

Lepper, Uwe, to Mobil Oil Corporation. Process for emulsion flooding of petroleum reservoirs. 4,488,602, Cl. 166-274.000.

Leroy, Michel: *See*—
Bertaud, Yves; and Leroy, Michel, 4,488,955, Cl. 204-243.00R.

Leuer, Karl-Rudi, to General Motors Corporation. Decoupling device for gearshift linkages. 4,488,448, Cl. 74-473.00R.

Leung, Yuen P., to Beecham Inc. Kit for producing antistatic and fabric softening article. 4,488,640, Cl. 206-229.000.

Leuvelink, Gerrit W. E., to Textiel Techniek Haaksbergen B.V. Method of and apparatus for arranging helical coils in interdigitated side-by-side disposition. 4,488,347, Cl. 29-433.000.

Levashov, Vladimir M.: *See*—
Karmyshin, Nikolai V.; Kudryashov, Evgeny I.; Orlov, Vladimir M.; Levashov, Vladimir M.; Khorin, Vladimir N.; and Antonov, Alexandr D., 4,488,757, Cl. 299-32.000.

Levendosky, Robert F.: *See*—
Gust, Edward W.; Levendosky, Robert F.; and Hochella, William A., 4,488,356, Cl. 29-882.000.

Lever Brothers Company: *See*—
Lamberti, Vincent, 4,488,989, Cl. 252-541.000.
Oakes, John, 4,488,980, Cl. 252-99.000.

Lewis, Bernard L.; and Kretschmer, Frank F., to United States of America, Navy. Interference suppressor for radar MTI. 4,489,320, Cl. 343-7.700.

Lewis, Bernard L. Orthogonalizer for inphase and quadrature digital data. 4,489,392, Cl. 364-724.000.

Lewis, Paul H., to Texaco Inc. Hydrocarbon isomerization. 4,489,216, Cl. 585-739.000.

Leybold-Heraeus GmbH: *See*—
Bubeck, Friedrich; and Reimpell, Uwe, 4,488,744, Cl. 285-408.000.
Ruthardt, Rolf, 4,488,859, Cl. 425-6.000.
Scherer, Michael; and Kubacha, Karl-Heinz, 4,488,956, Cl. 204-298.000.

Libby, Merle F.: *See*—
Linnell, William S., II; and Libby, Merle F., 4,488,623, Cl. 190-12.00A.

Licari, Vito. Adjustable rack for hanging articles. 4,488,650, Cl. 211-105.000.

Licciardello, Michael; and Boden, Richard M., to International Flavors & Fragrances Inc. Methyl carbonate of α,3,3-trimethyl cyclohexane methanol, organoleptic uses thereof and process for preparing same. 4,488,988, Cl. 252-522.00R.

Lieske, Helmut: *See*—
Auer, Peter; Kluge, Fritz; Lieske, Helmut; and Wutzler, Horst, 4,489,024, Cl. 264-71.000.

Life Light Systems: *See*—
Scolari, John E., 4,489,306, Cl. 340-107.000.

Ligensa, Karl-Heinz G.; and Cherdron, Philip, to Keiper U.S.A. Inc. Integral hand knob gear. 4,488,451, Cl. 74-553.000.

Light, Kenneth K.; Schreiber, William L.; McGhie, Joseph A.; Schreck, Ronald P.; Yoshida, Takao; Schreiber, Loren B.; and Muralidhara, Ranya, to International Flavors & Fragrances Inc. Process for producing solanone, norsolanadione and intermediates therefor. 4,489,009, Cl. 260-465.600.

Light Signatures, Inc.: *See*—
Goldman, Robert N., 4,489,318, Cl. 340-825.340.

Lincke, Paul, to Sulzer Brothers, Ltd. Gripper projectile. 4,488,579, Cl. 139-196.200.

Linde Aktiengesellschaft: *See*—
Foerg, Wolfgang; Scholz, Walter; and Marold, Freimut, 4,488,890, Cl. 62-17.000.

Lindenmann, Alois: *See*—
Hollenstein, Peter; and Lindenmann, Alois, 4,489,300, Cl. 337-186.000.

Lindow, Carl E., to FMC Corporation. Driving and braking system for electric motors. 4,489,257, Cl. 318-258.000.

Lindsey, Donald A. Heat saving device. 4,488,681, Cl. 237-55.000.

Ling, Robin S. M.: *See*—
Lee, Alan J. C.; and Ling, Robin S. M., 4,488,549, Cl. 128-303.00R.

Link, John: *See*—
Miller, Richard F.; and Link, John, 4,488,997, Cl. 260-414.000.
Miller, Richard F.; and Link, John, 4,488,998, Cl. 260-414.000.

Linnell, William S., II; and Libby, Merle F. Canoe travel box. 4,488,623, Cl. 190-12.00A.

Linville, Richard D. Method and apparatus for weighing a product suspended from a traveling conveyor. 4,488,635, Cl. 198-504.000.

Liquid Power, Inc.: *See*—
Gammon, Jimmie L., 4,488,473, Cl. 91-50.000.

Liska, Zbynek: *See*—
Jiruse, Jaroslav; and Liska, Zbynek, 4,488,484, Cl. 101-248.000.

Litherland, Albert E.; Kilius, Linas R.; and Hallin, Emil L., to Innovations Foundation of the University of Toronto, The. Method of broad band mass spectrometry and apparatus therefor. 4,489,237, Cl. 250-287.000.

Little, Bruce D.: *See*—
Fox, Robert L.; Frizzill, Alan W.; Little, Bruce D.; Progar, Donald J.; Coultrip, Robert H.; Couch, Richard H.; Gleason, John R.; Stein, Bland A.; Buckley, John D.; and St. Clair, Terry L., 4,488,335, Cl. 24-304.000.

Ljung, Erik A.: *See*—
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Lloyd, Frederick W.: *See*—
Brown, Peter L.; Fitzpatrick, Patrick C.; and Lloyd, Frederick W., 4,488,719, Cl. 272-72.000.

Loeffler, Thomas V., to Diamond Automations, Inc. Egg carrier. 4,488,637, Cl. 198-653.000.

Logan, Emanuel L., Jr.; and Walsh, J. William. Emergency exit indicators. 4,489,308, Cl. 340-286.00R.

Loge, Olaf: *See—*
Vorbrugger, Helmut; Schwarz, Norbert; Loge, Olaf; and Elger, Walter, 4,489,092, Cl. 424-304.000.

Loireau, Pierre, to Valeo. Torsional dampers. 4,488,629, Cl. 192-106.100.

Lomes, Pavel L., to Upjohn Company, The. Process for analgesic treatment. 4,489,080, Cl. 424-260.000.

Long, William B.: *See—*
Lamb, David E.; Long, William B.; and Sacco, William J., 4,489,387, Cl. 364-514.000.

Loof, Nils O. T. Method for drying wooden products. 4,488,361, Cl. 34-1.000.

Looger, Lonnie L.; and Smith, Gerald S., to United States of America, Army. Warhead safety and ribbon chute holder. 4,488,488, Cl. 102-387.000.

Look, Thomas F.: *See—*
Craig, Alan J.; and Look, Thomas F., 4,488,925, Cl. 156-351.000.

Lorch, Daniel L., to United States of America, Navy. Torso restraint system. 4,488,691, Cl. 244-151.00R.

L'Oreal: *See—*
Grollier, Jean F.; and Allec, Josiane, 4,488,564, Cl. 132-7.000.

Love, Gordon R., to Sprague Electric Company. Electroplating method for producing porous tantalum capacitor electrode. 4,488,941, Cl. 204-15.000.

Lowe, Derek: *See—*
Schopper, Bernd; Tandler, Peter; and Lowe, Derek, 4,488,742, Cl. 285-325.000.

Lowe, Lawrence A.; Smith, Terence W.; and Wilkinson, Samuel. Pharmaceutical compounds, preparation, use and intermediates therefor and their preparation. 4,489,062, Cl. 424-177.000.

Lowen, Stephen, to Nadel & Sons Toy Corp. Head-mounted motor-drives unit. 4,488,372, Cl. 446-27.000.

Lubitz, Peter: *See—*
Forester, Donald W.; Lubitz, Peter; and Vittoria, Carmine, 4,489,049, Cl. 423-644.000.

Lubrizol Corporation, The: *See—*
Hayashi, Katsumi, 4,489,194, Cl. 525-193.000.

Lucas Industries Limited: *See—*
Price, Anthony G.; and Campbell, Roy, 4,488,405, Cl. 60-581.000.

Lucassen, Wilhelmus H. P., to U.S. Philips Corporation. Solar collector unit. 4,488,539, Cl. 126-433.000.

Luck, Edward E.; and Daniels, John R. Non-antigenic collagen and articles of manufacture. 4,488,911, Cl. 106-161.000.

Luckanuck, John S. Fire-resistant sandwich core assembly. 4,489,121, Cl. 428-192.000.

Ludlow Corporation: *See—*
McCorkle, James L., 4,488,646, Cl. 206-459.000.

Luetzow, Edwin J., to TelTec Inc. Method for preparing electrical conductor. 4,489,231, Cl. 219-137.00R.

Luhman, Thomas S.: *See—*
Suenaga, Masaki; Klamut, Carl J.; and Luhman, Thomas S., 4,489,219, Cl. 174-128.00S.

Lui, Hoi; and Brinn, Benjamin F., Jr., to General Motors Corporation. Screw-down post terminal. 4,488,770, Cl. 339-263.00R.

Lundberg, Robert D.; Peiffer, Dennis G.; Duvdevani, Ilan; and Kowalik, Ralph M., to Exxon Research and Engineering Co. Drag reduction agent utilizing water soluble interpolymer complexes. 4,489,180, Cl. 523-175.000.

Lundgren, George L., Sr. Hay feeder. 4,488,510, Cl. 119-60.000.

Lusignan, Bruce B.; and Najafi, Hamid, to Leland Stanford, Junior University, The Board of Trustees of the. Telephone line interface. 4,489,222, Cl. 177-170.200.

M/A-COM DCC, Inc.: *See—*
Richmond, Robert L.; Corrigan, John E.; and Wyar, Paul F., 4,489,413, Cl. 370-30.000.

M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Gebhardt, Hans, 4,488,447, Cl. 74-397.000.

M.U. Engineering & Manufacturing Inc.: *See—*
Skinner, James R., 4,488,776, Cl. 350-242.000.

Mack, Ralph B. Multiple purpose lawn mower having disposable receptacle. 4,488,395, Cl. 56-13.400.

MacQuivey, Donald R. Method and apparatus for minority view reduction. 4,489,316, Cl. 340-700.000.

MacTaggart Scott & Co., Ltd.: *See—*
Brandt, Ulrich; and Gray, Anthony J., 4,488,693, Cl. 244-116.000.

Magnex Corporation: *See—*
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Maki, Yoshitaka: *See—*
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Manara, Luciano: *See—*
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Manchego, Robert: *See—*
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Mannesman Rexroth GmbH: *See—*
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Mannesmann Aktiengesellschaft: *See—*
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Marathon Manufacturing Company: *See—*
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Marazas, Gerald A.: *See—*
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Marburg, Stephen: *See—*
Tolman, Richard L.; Marburg, Stephen; and Callahan, Lynn T., III, 4,488,991, Cl. 260-112.00R.

Marconi, Walter: *See—*
Olivieri, Roberto; Eletti Bianchi, Giancarlo; Fascetti, Eugenio; Centini, Felice; Degen, Ludwig; and Marconi, Walter, 4,489,208, Cl. 562-470.000.

Marissen, Roelof: *See—*
Schijve, Jacobus; Vogelesang, Laurens B.; and Marissen, Roelof, 4,489,123, Cl. 428-213.000.

Marjoram, Robert H., to Dunlop Limited. Fluid suspensions. 4,488,613, Cl. 180-89.150.

Mark, Kelly J., to Watts, Larry D.; Atkins, Wm. G.; and Harnach, Mike. Rack for plural cylindrical objects. 4,488,649, Cl. 211-49.00S.

Mark, Seymour, to Standard Oil Company, The. Coal-aqueous mixtures having a particular coal particle size distribution. 4,488,881, Cl. 44-51.000.

Markussen, Jan, to Novo Industri A/S. Process for preparing esters of human insulin. 4,489,159, Cl. 435-71.000.

Marold, Freimut: *See—*
Foerg, Wolfgang; Scholz, Walter; and Marold, Freimut, 4,488,890, Cl. 62-17.000.

Marracino, Charles R.: *See—*
Cavagnero, Erman V.; English, George A.; and Marracino, Charles R., 4,488,825, Cl. 384-152.000.

Mars, Limited: *See—*
French, John, 4,489,288, Cl. 331-87.000.

Martel, Jacques; Tessier, Jean; and Teche, Andre , to Roussel Uclaf. Insecticidal esters. 4,489,093, Cl. 424-304.000.

Martens, Rolf: *See—*
Anderka, Gerold; Brandt, Joachim; DeBlitz, Gerhard; Martens, Rolf; Paschen, Rolf; Post, Jurgen; and Willimczik, Bernd, 4,489,333, Cl. 346-139.00R.

Martin, Donald R.: *See—*
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Martin, Henry: *See—*
Fory, Werner; Martin, Henry; and Pissiotas, Georg, 4,488,898, Cl. 71-96.000.
Fory, Werner; Martin, Henry; and Pissiotas, Georg, 4,488,899, Cl. 71-105.000.
Fory, Werner; Martin, Henry; and Pissiotas, Georg, 4,488,900, Cl. 71-105.000.

Martin Marietta Corporation: *See—*
Nicholson, Richard R.; Vista, Sally L.; and Berkey, Reynold A., 4,488,910, Cl. 106-90.000.

Martin, Sylvia; and Herr, R. Wilbur, to OMI International Corporation. Zinc and zinc alloy electroplating bath and process. 4,488,942, Cl. 204-44.200.

Martin, Thomas B., to Advanced Control Systems. Contactless switch and joystick controller using Hall elements. 4,489,303, Cl. 338-128.000.

Martin, Yolanda E.: *See—*
Lang, Stephen P.; Martin, Yolanda E.; Pinkston, Patrick E.; and Rao, Kanaparty N., 4,489,305, Cl. 340-57.000.
Lang, Stephen P.; Martin, Yolanda E.; and Norton, Richard G., 4,489,311, Cl. 340-501.000.

Martinez, Felix J.: *See—*
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Marutake, Yozo; Fukutome, Tatsuro; Asami, Motomu; and Motohashi, Hideo, to Rion Kabushiki Kaisha. Electromagnetic induction coil antenna. 4,489,330, Cl. 343-742.000.

Marvin Glass & Associates: *See—*
Glickson, David A.; and Disko, Harry, 4,488,373, Cl. 446-4.000.

Maschinenfabrik Hennecke GmbH: *See—*
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Mason, Beatrice R., to Bowers, Kenneth R., Jr. Face mask. 4,488,547, Cl. 128-202.220.

Massachusetts Institute of Technology: *See—*
Parenti, Ronald R.; and Keicher, William E., 4,489,390, Cl. 364-724.000.

Masters, William E. Kayak improvements. 4,489,028, Cl. 264-154.000.

Masu, Masanobu: *See—*
Sugio, Akitoshi; Masu, Masanobu; Okabe, Masao; and Ukita, Eiji, 4,489,186, Cl. 524-151.000.

Masuda, Naosuke; Suzuki, Yoshio; and Fujii, Tadaaki, to Jidosha Kiki Co., Ltd. Power steering apparatus. 4,488,475, Cl. 91-462.000.

Masuda, Shigeru; Okado, Hiroyuki; and Mori, Teijiro, to Mitsubishi Denki Kabushiki Kaisha. Electromagnetic contactor. 4,489,225, Cl. 200-144.00R.

Matayoshi, Yutaka: *See—*
Nagai, Tadashi; Ohnishi, Eiichi; Shioyama, Giichi; and Matayoshi, Yutaka, 4,489,014, Cl. 261-44.00C.

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Matray, Attila: *See—*
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Matsuda, Tadahito; Okubo, Tsuneo; Ozasa, Susumu; Saitou, Norio; and Yoda, Haruo, to Hitachi, Ltd.; and Nippon Telegraph & Telephone Public Corporation. Exposure method with electron beam exposure apparatus. 4,489,241, Cl. 250-491.100.

Matsuda, Yoshio: *See*—
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Matsukawa, Hiroharu: *See*—
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Matsumoto, Masayuki: *See*—
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Matsumoto, Ryutaro: *See*—
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Matsumoto, Shozo: *See*—
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Matsumura, Sadao: *See*—
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Matsushita Electric Industrial Co., Ltd.: *See*—
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Kohashi, Tadao, 4,488,785, Cl. 350-360.000.
Matsushita, Tsuyoshi, to Tokyo Electric Co., Ltd. Method of driving a stepping motor and a drive circuit thereof. 4,489,260, Cl. 318-696.000.
Matsuura, Shin: *See*—
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Matusik, Frank J.; and Nelson, Donald W., to National Metal and Refining Company, Ltd. Rotational vibratory viscometer transducer and circuit. 4,488,427, Cl. 73-59.000.
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Mayrand, James F., to Sprague Electric Company. Merged-transistor switch with extra P-type region. 4,489,341, Cl. 357-51.000.
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Nishida, Toshiaki; Okazaki, Kazuyuki; Kakumoto, Hideki; and Ikeda, Tatsuji, 4,488,529, Cl. 123-438.000.
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Mazo, James E., to AT&T Bell Laboratories. Differential encoding technique. 4,489,418, Cl. 375-27.000.
McAlister, Roy E. Solar heating system, and improved heat collecting and radiating components, for livestock-confining buildings. 4,488,540, Cl. 126-438.000.
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McClure, David K., to Marathon Manufacturing Company. Cord lock for venetian blind. 4,488,588, Cl. 160-178.00C.
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McDaniel, Max P., to Phillips Petroleum Company. Activated chromium catalyst treated with tertiary alcohol. 4,489,172, Cl. 502-239.000.
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Urfer, Allen D.; VanderBurgh, Leonard F.; and McDaniel, Robert S., Jr., 4,488,981, Cl. 252-174.170.
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Preble, John M.; Anderson, John A.; and McGee, Lawrence D., 4,488,856, Cl. 417-409.000.
McGhie, Joseph A.: *See*—
Light, Kenneth K.; Schreiber, William L.; McGhie, Joseph A.; Schreck, Ronald P.; Yoshida, Takao; Schreiber, Loren B.; and Muralidhara, Ranya, 4,489,009, Cl. 260-465.600.
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Holmgren, Nils V.; and Martin, Donald R., 4,489,226, Cl. 200-148.00A.
Hurley, James R.; and Gilker, Clyde, 4,489,384, Cl. 364-483.000.
McKay, Dwight L.: *See*—
Bertus, Brent J.; and McKay, Dwight L., 4,489,169, Cl. 502-64.000.
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Edling, Ellsworth A.; McKenna, Richard P.; Trexler, Frederick D.; and Peterick, E. Thomas, Jr., 4,489,269, Cl. 322-2.00R.
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McLeod, Mark H., to International Business Machines Corporation. Test circuit for turn-on and turn-off delay measurements. 4,489,272, Cl. 324-73.00R.
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Brown, David; Hargreaves, Rodney B.; McLoughlin, Bernard J.; and Mills, Stuart D., 4,489,074, Cl. 424-246.000.
Hargreaves, Rodney B.; McLoughlin, Bernard J.; and Mills, Stuart D., 4,489,073, Cl. 424-246.000.
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McRea, James C.: *See*—
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Mead Corporation, The: *See*—
Hinton, Teresa L.; and Spamer, William S., 4,488,652, Cl. 211-183.000.
Sanders, Frederick W.; Hillenbrand, Gary F.; Arney, Jonathan S.; and Wright, Richard F., 4,489,151, Cl. 430-138.000.
Mead Johnson & Company: *See*—
Temple, Davis L., Jr., 4,489,078, Cl. 424-251.000.
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Kraft, Thomas L.; Vick, Howard A.; and Meador, James W., 4,488,812, Cl. 356-338.000.
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Kissinger, Curtis; and Dorman, Richard, 4,488,813, Cl. 356-375.000.
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Wilson, Michael T., 4,488,320, Cl. 3-15.000.
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Fedeli, Gianfranco, 4,489,066, Cl. 424-181.000.
Medtronic, Inc.: *See*—
Doring, John D., 4,488,561, Cl. 128-786.000.
Mehlman, Stewart K., to Union Carbide Corporation. Rapid decarburization steelmaking process. 4,488,903, Cl. 75-52.000.
Meikle, David. Bending tool. 4,488,425, Cl. 72-389.000.
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Ballone, Michael P.; and Meisner, Edward H., 4,488,460, Cl. 81-60.000.
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Himmelstein, Kenneth J.; and Higuchi, Takeru, 4,489,056, Cl. 424-22.000.
Tolman, Richard L.; Marburg, Stephen; and Callahan, Lynn T., III, 4,488,991, Cl. 260-112.00R.
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Wang, Samuel S. M., 4,489,011, Cl. 260-501.190.
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Wanninger, Paul; and Kleinschmidt, Ernst, 4,488,916, Cl. 149-2.000.
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Ball, Martin F., 4,489,018, Cl. 264-25.000.
Metal Craft Company: *See*—
Goforth, Ronald D., 4,488,334, Cl. 24-277.000.
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Walker, Herbert B.; and Hoppough, Richard S., 4,489,221, Cl. 179-19.000.

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Milde, Helmut I., to High Voltage Engineering Corporation. Electrostatic charging apparatus. 4,488,885, Cl. 55-139.000.

Miles Laboratories, Inc.: *See*—
Johnson, Leighton C., 4,488,814, Cl. 356-414.000.

Miles, Ronald C., to Olin Corporation. Process of operation of catholyteless membrane electrolytic cell. 4,488,947, Cl. 204-98.000.

Millard, Barry J., to Adwest Engineering Ltd. Rack and pinion steering gear and vehicle fitted with same. 4,488,615, Cl. 180-148.000.

Miller, Dye O.; Antunes, August J.; and Antunes, Jerome. Continuous cooking device. 4,488,480, Cl. 99-386.000.

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Miller, John E.: *See*—
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Miller, John M.; and Barton, Richard O., to Grumman Aerospace Corporation. Planizing target. 4,488,809, Cl. 356-138.000.

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Brown, David; Hargreaves, Rodney B.; McLoughlin, Bernard J.; and Mills, Stuart D., 4,489,074, Cl. 424-246.000.
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McConnaughey, Paul W.; and McKee, Elmer S., 4,489,164, Cl. 436-130.000.

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Craig, Alan J.; and Look, Thomas F., 4,488,925, Cl. 156-351.000.
Kammin, Marvin R.; and Russell, Terrance J., 4,489,122, Cl. 428-212.000.

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Kawamura, Takao; and Yoshida, Masazumi, 4,489,149, Cl. 430-65.000.

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Misson, Donald A., to Lear Siegler, Inc. Automatic gear checking structure and method. 4,488,359, Cl. 33-179.50C.

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Salem, Robert J., 4,488,824, Cl. 374-181.000.

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Mitsubishi Acetate Co., Ltd.: *See*—
Morifuji, Kazuhiko; Okura, Hirohumi; and Sakai, Takashi, 4,488,563, Cl. 131-336.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Ishizaki, Yasuhiro, 4,489,283, Cl. 330-268.000.
Kitamura, Hiroaki, 4,489,361, Cl. 361-333.000.
Masuda, Shigeru; Okado, Hiroyuki; and Mori, Teijiro, 4,489,225, Cl. 200-144.00R.
Tsutsumi, Kazumichi; and Ueda, Tadakazu, 4,488,525, Cl. 123-352.000.
Yoshida, Yasuhiro, 4,489,374, Cl. 363-145.000.

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Sugio, Akitoshi; Masu, Masanobu; Okabe, Masao; and Ukita, Eiji, 4,489,186, Cl. 524-151.000.

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Morifuji, Kazuhiko; Okura, Hirohumi; and Sakai, Takashi, 4,488,563, Cl. 131-336.000.

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Uda, Naotake; Kouno, Yasuo; and Shiomura, Tadayoshi, 4,489,033, Cl. 264-328.700.

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Mittal, Faquir C.; and Phillips, Edwin R., to Sperry Corporation. Oscillating coolant pump. 4,488,592, Cl. 165-104.310.

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Miura, Teruo: *See*—
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Miyabayashi, Nobuhiro: *See*—
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Saitoh, Shinji; Miyamoto, Junichi; and Ichinose, Kazuaki, 4,489,402, Cl. 365-200.000.

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Mobay Chemical Corporation: *See*—
Parigi, Joseph V., 4,488,884, Cl. 55-71.000.

Mobil Oil Corporation: *See*—
Dibiasi, Daniel J., 4,489,020, Cl. 264-26.000.
Fan, Mark J., 4,488,600, Cl. 166-263.000.
Krieg, Donald J., 4,488,924, Cl. 156-251.000.
Lepper, Uwe, 4,488,602, Cl. 166-274.000.
Savins, Joseph G.; and Johnson, Warren F., 4,489,042, Cl. 423-20.000.

Mock, Elmar: *See*—
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Goodwin, John D.; and Mulkey, Forrest W., III, 4,488,908, Cl. 106-75.000.

Momose, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for manufacturing semiconductor device. 4,488,351, Cl. 29-578.000.

Monarch Marking Systems, Inc.: *See*—
Hamisch, Paul H., Jr., 4,482,671, Cl. 226-79.000.

Monsanto Company: *See*—
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Sikorski, James A.; and Hoobler, Mary A., 4,488,894, Cl. 71-87.000.
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Moody, Roy A.: *See*—
Caveney, Jack E.; and Moody, Roy A., 4,488,353, Cl. 29-749.000.

Mookherjee, Braja D.: *See*—
Hill, Ira D.; Trenkle, Robert W.; Mookherjee, Braja D.; and Wolff, Robin K., 4,488,973, Cl. 252-8.600.

Moore, James I.; and Van Huis, Philip J., to Ex-Cell-O Corporation. Shot cylinder controller. 4,488,589, Cl. 164-155.000.

Moore, Michael E.; and Papasideris, Stamos I., to Caterpillar Tractor Co. Cable mounting and adjustment means. 4,488,449, Cl. 74-501.00R.

Mordes, John P.: *See*—
Rossini, Aldo A.; Mordes, John P.; Leeman, Susan E.; Carraway, Robert E.; and Ruane, Susan E., 4,489,059, Cl. 424-106.000.
Moren, Lars G.; Berg, Ulf P.; and Hedlund, Bengt G., to Aktiebolaget Electrolux. Device for controlling a reluctance motor. 4,489,262, Cl. 318-700.000.
Morgan, Craig R.: *See*—
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Morgan, Steven J.; Lauyans, Frank M.; and Judge, Gregory R., to Figgie International Inc. Live roller accumulating brake conveyor. 4,488,638, Cl. 198-781.000.
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Morifuji, Kazuhiko; Okura, Hirohumi; and Sakai, Takashi, to Mitsubishi Acetate Co., Ltd.; and Mitsubishi Rayon Co., Ltd. Filter plug. 4,488,563, Cl. 131-336.000.
Morikawa, Kouji, to Fuji Jukogyo Kabushiki Kaisha. System for controlling the ignition timing of a combustion engine. 4,488,528, Cl. 123-425.000.
Morikawa, Shigenori, to Casio Computer Co., Ltd. Digital filter apparatus having a resonance characteristic. 4,489,391, Cl. 364-724.000.
Morris, Gregory J. E.; Beaver, Richard N.; Grosshandler, Sandor; Dang, Hiep D.; and Pimlott, John R., to Dow Chemical Company, The. Unitary central cell element for filter press electrolysis cell structure and use thereof in the electrolysis of sodium chloride. 4,488,946, Cl. 204-98.000.
Morse, David L.: *See*—
Borrelli, Nicholas F.; Elmer, Thomas H.; Morse, David L.; and Sachenik, Paul A., 4,488,864, Cl. 430-13.000.
Mosca, Ronald J. Mistletoe supporting headband. 4,488,316, Cl. 2-171.000.
Moshier, Stephen L., to Exxon Corporation. Speech recognition method and apparatus. 4,489,434, Cl. 381-43.000.
Moshier, Stephen L., to Exxon Corporation. Method and apparatus for continuous word string recognition. 4,489,435, Cl. 381-43.000.
Mosley, Earnest D.; and Williams, Oliver L. Chain binder and reversing lever knuckle. 4,488,707, Cl. 254-243.000.
Motegi, Masahiko: *See*—
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Motohashi, Hideo: *See*—
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Motorola, Inc.: *See*—
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Mototsuna, Kazumichi; Fujitani, Takashi; Okumura, Yoshito; Nemoto, Iwao; and Kitaguchi, Shuichi, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Device for preventing bottom of ships hold from being cooled by leaked liquid from low temperature liquid storage tank carried by ship. 4,488,500, Cl. 114-74.00A.
Moulineau, Claude: *See*—
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Muenger, James R.: *See*—
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Muhl, Reinhold: *See*—
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Mulford, Cass F. Structural building members and wall incorporating same. 4,488,390, Cl. 52-407.000.
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Goodwin, John D.; and Mulkey, Forrest W., III, 4,488,908, Cl. 106-75.000.
Muller, Hans; and Schumacher, Ivo, to DrM, Dr. Muller AG. Arrangement for fastening filter candles and filter apparatus provided therewith. 4,488,965, Cl. 210-232.000.
Muller, Jacques; and Mock, Elmar, to ETA S.A., Fabriques d'Ebauches. Method and apparatus for assembling a watch case having improved structure for installing a battery cell. 4,488,345, Cl. 29-177.000.
Muller, Samuel: *See*—
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Muller, Werner: *See*—
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Mulock-Bentley, Desmond, to D. Mulock-Bentley and Associates (Proprietary) Limited. Heat exchanger. 4,488,593, Cl. 165-151.000.
Murakami, Koichi; and Mihara, Teruyoshi, to Nissan Motor Company, Limited. Method of repairing shorts in parallel connected vertical semiconductor devices by selective anodization. 4,488,349, Cl. 29-575.000.
Murakami, Morio, to Tiger Vacuum Bottle Industrial Company, Limited. Vacuum bottle. 4,488,660, Cl. 220-425.000.
Muralidhara, Ranya: *See*—
Light, Kenneth K.; Schreiber, William L.; McGhie, Joseph A.; Schreck, Ronald P.; Yoshida, Takao; Schreiber, Loren B.; and Muralidhara, Ranya, 4,489,009, Cl. 260-465.600.
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Murray, William F. Sports training glove including pressure actuated switches for alarm circuit. 4,488,726, Cl. 273-183.00B.
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Myers, Jay E. Duffle bag security. 4,488,624, Cl. 190-120.000.
Myers, William T., Jr.: *See*—
Perry, Robert E.; and Myers, William T., Jr., 4,488,833, Cl. 404-35.000.
Naarmann, Herbert; Simak, Petr; and Kohler, Gernot, to BASF Aktiengesellschaft. Preparation of electrically conductive polyarylene compounds having electron-attracting side groups. 4,488,986, Cl. 252-500.000.
Nadel & Sons Toy Corp.: *See*—
Lowen, Stephen, 4,488,372, Cl. 446-27.000.
Nagai, Tadashi; Ohnishi, Eiichi; Shioyama, Giichi; and Matayoshi, Yutaka, to Nissan Motor Company, Limited. Variable venturi carburetor. 4,489,014, Cl. 261-44.00C.
Nagano, Katsumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Current source circuit. 4,489,244, Cl. 307-296.00R.
Nagano, Masashi, to Shimano Industrial Company Limited. Handle stem for a bicycle. 4,489,307, Cl. 340-134.000.
Nagumo, Masahide; and Kojima, Tadashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Phase synchronizing circuit for digital data reproduction. 4,489,287, Cl. 331-1.00A.
Nagy, Jozsef: *See*—
Farkas, Tibor; Horvath, Ibolya; Horvath, Laszlo I.; Vigh, Laszlo; Dombay, Zsolt; Nagy, Jozsef; Nagy nee Gera, Emilia; Pavlicsak, Csaba; and Tarpai, Gyula, 4,488,901, Cl. 71-121.000.
Nagy nee Gera, Emilia: *See*—
Farkas, Tibor; Horvath, Ibolya; Horvath, Laszlo I.; Vigh, Laszlo; Dombay, Zsolt; Nagy, Jozsef; Nagy nee Gera, Emilia; Pavlicsak, Csaba; and Tarpai, Gyula, 4,488,901, Cl. 71-121.000.
Naimpally, Saiprasad V., to RCA Corporation. Inductive electrical signal filter with reduced impedance. 4,489,286, Cl. 330-303.000.
Najafi, Hamid: *See*—
Lusignan, Bruce B.; and Najafi, Hamid, 4,489,222, Cl. 177-170.200.
Nakagawa, Taizo; Matsumoto, Shozo; and Ohmori, Kaoru, to Nippon Kayaku Kabushiki Kaisha. Soil fungicidal agent for agriculture and horticulture. 4,489,086, Cl. 424-273.00R.
Nakai, Masanori: *See*—
Ikeda, Masashi; Tokumaru, Yukuya; Nakai, Masanori; and Ota, Masaki, 4,489,247, Cl. 307-477.000.
Nakamura, Shinya: *See*—
Taga, Yutaka; and Nakamura, Shinya, 4,488,456, Cl. 74-866.000.
Nakamura, Toshiaki; and Miyabayashi, Nobuhiro, to Olympus Optical Co., Ltd. Motor support apparatus. 4,488,700, Cl. 248-633.000.
Nakane, Takeshi: *See*—
Mohri, Kaneo; and Nakane, Takeshi, 4,488,436, Cl. 73-726.000.
Nakanishi Metal Works Co., Ltd.: *See*—
Wakabayashi, Takao, 4,488,493, Cl. 104-172.00S.
Nakao, Masami: *See*—
Tadokoro, Tomoo; Okimoto, Haruo; Nakao, Masami; and Iwaki, Masato, 4,488,531, Cl. 123-559.000.
Nakazawa, Kazuharu. Method of solidifying bile. 4,489,060, Cl. 424-106.000.
Nalco Chemical Company: *See*—
Kaplan, Morris, 4,488,984, Cl. 252-313.00R.
Nappholz, Tibor A.; and Swift, Stephen J., to Telectronics Pty. Ltd. Externally controlled tachycardia control pacer. 4,488,553, Cl. 128-419.0PG.
Nappholz, Tibor A.; and Swift, Stephen J., to Telectronics Pty. Ltd. Externally-inhibited tachycardia control pacer. 4,488,554, Cl. 128-419.0PG.
Narasawa, Takashi: *See*—
Itani, Takashi; Kozuki, Susumu; and Narasawa, Takashi, 4,489,345, Cl. 358-29.000.
Narita, Hirokazu: *See*—
Sadaki, Hiroshi; Narita, Hirokazu; Imaizumi, Hiroyuki; Konishi, Yoshinori; Inaba, Takihiro; Hirakawa, Tatsuo; Taki, Hideo; Tai, Masaru; Watanabe, Yasuo; and Saikawa, Isamu, 4,489,072, Cl. 424-246.000.
Nartron Corporation: *See*—
Miller, Gerald K.; Taylor, Robert E.; and Rautiola, Norman A., 4,488,521, Cl. 123-179.0BG.
National Data Corporation: *See*—
Hughes, Steve A., 4,489,438, Cl. 381-51.000.
National Machinery Company, The: *See*—
Wisebaker, Robert E., 4,488,426, Cl. 72-450.000.
National Metal and Refining Company, Ltd.: *See*—
Matusik, Frank J.; and Nelson, Donald W., 4,488,427, Cl. 73-59.000.
National Research Development Corporation: *See*—
Joseph, Stephen H.; Miller, John E.; and Williamson, Lawrie A., 4,488,860, Cl. 425-131.100.
Pooley, Frederick D.; Jones, Huw O.; and Wheatley, Barry I., 4,488,950, Cl. 204-116.000.
Tseung, Alfred C. C.; Chan, Ho C.; Fouzder, Nani B.; and Sriskandarajah, Thurairajah, 4,488,578, Cl. 138-146.000.
National Semiconductor Corporation: *See*—
Jett, William B., Jr., 4,489,282, Cl. 330-261.000.

National Starch and Chemical Corporation: *See*—
Shih, Yen-Jer; and Iovine, Carmine P., 4,489,192, Cl. 524-813.000.
Natsume, Toshio: *See*—
Miura, Hirohisa; Satou, Hiroshi; and Natsume, Toshio, 4,488,904, Cl. 75-62.000.
NCR Corporation: *See*—
Chen, Kasun K.; Erickson, Gerald J.; Schuck, David B.; and Stone, James W., 4,488,354, Cl. 29-830.000.
NEC Corporation: *See*—
Yasuoka, Nobuyuki, 4,489,404, Cl. 365-230.000.
Nederlandse Centrale Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek: *See*—
de Jong, Willem A.; and van der Linde, Berend J., 4,489,047, Cl. 423-230.000.
Nelson, Donald W.: *See*—
Matusik, Frank J.; and Nelson, Donald W., 4,488,427, Cl. 73-59.000.
Nemoto, Iwao: *See*—
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Nemschoff Chairs, Inc.: *See*—
Nemschoff, Leonard M., 4,488,755, Cl. 297-443.000.
Nemschoff, Leonard M., to Nemschoff Chairs, Inc. Chair with reversible seat and back cushions. 4,488,755, Cl. 297-443.000.
Neri, Amleto; Capitanio, Lorenzo; and Stefani, Giancarlo, to Alusuisse Italia S.p.A. Catalyst for the preparation of phthalic anhydride. 4,489,204, Cl. 549-248.000.
Networks Electronic Corp.: *See*—
Patrichi, Mihai D., 4,488,977, Cl. 252-12.400.
New Process Industries, Inc.: *See*—
Benson, Glendon M., 4,488,853, Cl. 417-240.000.
Newell, Burtram I.; Bertolette, Reed; and Fogarty, Bruce C., to Bertolette Machines, Inc. Straightening machine. 4,488,423, Cl. 72-385.000.
NFS Industries, Inc.: *See*—
Teasel, William A.; Teasel, Thomas M.; and Colwell, Thomas R., 4,488,385, Cl. 52-92.000.
NGK Insulators, Ltd.: *See*—
Wada, Shigetaka; and Yamada, Toshio, 4,489,232, Cl. 219-206.000.
Nibco Inc.: *See*—
Runyan, Gary L.; and Sloan, Paul H., Jr., 4,488,573, Cl. 137-375.000.
Nicholson, Margie M., to Rockwell International Corporation. Method of producing a color change in a chemically coupled color-changing display. 4,488,780, Cl. 350-320.000.
Nicholson, Peter N.: *See*—
Jungkman, David L.; Coda, Roger C.; and Nicholson, Peter N., 4,488,414, Cl. 62-514.00R.
Nicholson, Richard R.; Vista, Sally L.; and Berkey, Reynold A., to Martin Marietta Corporation. Admixture for nonplastic cement mixes and method. 4,488,910, Cl. 106-90.000.
Niemeijer, Halbe J., to Dawsonville Corporation N.V. Tattooing device and program carrier therefore. 4,488,550, Cl. 128-316.000.
Nihei, Ryo: *See*—
Inaba, Hajimu; Sakakibara, Shinsuke; and Nihei, Ryo, 4,488,746, Cl. 294-86.00R.
Nihon Medi-Physics Co., Ltd.: *See*—
Azuma, Makoto; and Hazue, Masaaki, 4,489,053, Cl. 424-1.100.
Nippon Electric Co., Ltd.: *See*—
Ikeda, Masaki; Amano, Tatsuyuki; and Tokuda, Kazuo, 4,489,344, Cl. 358-22.000.
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Riyono, Mikio, 4,489,281, Cl. 330-129.000.
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Nippon Gakki Seizo Kabushiki Kaisha: *See*—
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Nippon Hoso Kyokai: *See*—
Koinuma, Tokuju; Tashiro, Norio; and Yamamoto, Kaizo, 4,489,254, Cl. 315-39.510.
Nippon Kayaku Kabushiki Kaisha: *See*—
Nakagawa, Taizo; Matsumoto, Shozo; and Ohmori, Kaoru, 4,489,086, Cl. 424-273.00R.
Nippon Light Metal Co., Ltd.: *See*—
Uesaka, Susumu; Hagiwara, Toshio; Yusen, Akira; Takayama, Minoru; and Urakami, Shinichi, 4,488,817, Cl. 366-149.000.
Nippon Notion Kogyo Co., Ltd.: *See*—
Kasai, Kazumi, 4,488,339, Cl. 24-575.000.
Nippon Soken, Inc.: *See*—
Sekiguchi, Kiyonori; Tanaka, Takeshi; Kawagoe, Michio; and Yamada, Mitsumasa, 4,488,533, Cl. 123-569.000.
Nippon Steel Corporation: *See*—
Gondo, Hisashi; Matsumoto, Ryutaro; Ohno, Jiro; and Suzuki, Ryoichi, 4,488,906, Cl. 75-123.00M.
Nippon Telegraph & Telephone Public Corporation: *See*—
Matsuda, Tadahito; Okubo, Tsuneo; Ozasa, Susumu; Saitou, Norio; and Yoda, Haruo, 4,489,241, Cl. 250-491.100.
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Nippondenso Co., Ltd.: *See*—
Hara, Kiyoshi, 4,488,411, Cl. 62-133.000.
Hara, Masahiro; Okamoto, Atsutoshi; and Sakai, Toshiyasu, 4,488,678, Cl. 235-463.000.
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Sugiura, Kengo; Yamauchi, Yasutaka; and Ito, Hiroshi, 4,488,524, Cl. 123-339.000.
Nishida, Hirozi: *See*—
Shima, Masahiro; and Nishida, Hirozi, 4,488,416, Cl. 66-149.00R.
Nishida, Toshiaki; Okazaki, Kazuyuki; Kakumoto, Hideki; and Ikeda, Tatsuji, to Mazda Motor Corporation. Automobile air/fuel control system. 4,488,529, Cl. 123-438.000.
Nishiguchi, Takuji; and Yoshimoto, Hideo, to Sharp Kabushiki Kaisha. Packing case of corrugated paper and positioning method of an article using the same. 4,488,641, Cl. 206-320.000.
Nishihama, Takamichi; and Otsuji, Masahiko, to Dainippon Screen Manufacturing Co., Ltd. Slit exposure type copying camera. 4,488,803, Cl. 355-28.000.
Nishikawa, Masao; Hattori, Torao; Aoki, Takashi; and Yoshizawa, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Transmission apparatus for a vehicle. 4,488,446, Cl. 74-330.000.
Nishimura, Sadanori; Ishikawa, Keiichi; and Shimada, Hiroyuki, to Honda Giken Kogyo Kabushiki Kaisha. Malfunction prevention device of automotive hydraulic transmission. 4,488,457, Cl. 74-868.000.
Ninhio, Ken-ichi: *See*—
Yamatsuta, Kohji; and Niahio, Ken-ichi, 4,489,138, Cl. 428-614.000.
Nishiuchi, Koichi, to Fujitsu Limited. Field effect transistor logic circuit having high operating speed and low power consumption. 4,489,246, Cl. 307-448.000.
Nissan Motor Company, Limited: *See*—
Koike, Shyouichi, 4,488,753, Cl. 296-201.000.
Murakami, Koichi; and Mihara, Teruyoshi, 4,488,349, Cl. 29-575.000.
Nagai, Tadashi; Ohnishi, Eiichi; Shioyama, Giichi; and Matayoshi, Yutaka, 4,489,014, Cl. 261-44.00C.
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Niznick, Gerald A., to A&L Investment Company. Connector for overdenture. 4,488,875, Cl. 433-173.000.
Nobumoto, Kazutoshi; and Sumida, Shizuo, to Toyo Kogyo Co., Ltd. Clutch control system for automobiles. 4,488,625, Cl. 192-3.580.
Noguchi, Kosaku; Tanaka, Honami; Kumura, Yukimasa; Kitajima, Eiji; and Ishitobi, Toshifumi, to Koa Oil Company, Ltd. Method and apparatus for production of crystallizable carbonaceous material. 4,488,957, Cl. 208-40.000.
Noguchi, Tadashi: *See*—
Ishida, Kohji; Numata, Tatsuo; and Noguchi, Tadashi, 4,489,430, Cl. 381-7.000.
Noguchi, Yoshiki, to Hitachi, Ltd. Power plant integrated with coal gasification. 4,488,398, Cl. 60-39.120.
Nola, Frank J., to United States of America, National Aeronautics and Space Administration. Solar powered actuator with continuously variable auxiliary power control. 4,489,243, Cl. 307-64.000.
Nolan, Mary E.; and LaConti, Anthony B., to General Electric Company. Integrated electrochemical/chemical oxygen generating system. 4,488,951, Cl. 204-129.000.
North American Philips Corporation: *See*—
Kenney, George C., 4,488,789, Cl. 350-486.000.
Wank, Larry A.; and Braitling, Joseph G., 4,489,168, Cl. 501-134.000.
Norton, Richard G.: *See*—
Lang, Stephen P.; Martin, Yolanda E.; and Norton, Richard G., 4,489,311, Cl. 340-501.000.
Nothnagel, Eugene A.: *See*—
Barak, Lawrence S.; Nothnagel, Eugene A.; Webb, Watt W.; and Yocum, Robert R., 4,489,001, Cl. 260-112.50R.
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Markussen, Jan, 4,489,159, Cl. 435-71.000.
Novy, Robert A.: *See*—
Sloan, Norman R.; Remys, Dionizas; and Novy, Robert A., 4,488,479, Cl. 99-345.000.
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Ishida, Kohji; Numata, Tatsuo; and Noguchi, Tadashi, 4,489,430, Cl. 381-7.000.
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Couvreur, Patrick; Roland, Michel; and Speiser, Peter, 4,489,055, Cl. 424-7.100.
Nylund, Olov, to AB Asea-Atom. Fuel assembly for a nuclear reactor. 4,489,038, Cl. 376-446.000.
O & K Orenstein & Koppel Aktiengesellschaft: *See*—
Klucker, Klaus, 4,488,849, Cl. 414-566.000.
Oakes, John, to Lever Brothers Company. Detergent compositions. 4,488,980, Cl. 252-99.000.
Oberhauser, David F.; and Roth, Peter H., to Polaroid Corporation. Photographic product for silver transfer images with polyvinylpyrrolidone in carbon black layer. 4,489,152, Cl. 430-229.000.
Occidental Chemical Corporation: *See*—
Tang, David Y.; and Colson, James G., 4,488,953, Cl. 204-163.00R.
Oce-Helioprint AS: *See*—
Andersen, Steen, 4,488,805, Cl. 355-69.000.
Ochi, Yukio; Hachiya, Takashi; Miyazaki, Tadayoshi; and Kajita, Yoshihiro, to Baxter Travenol Laboratories, Inc. Methods and compositions for cancer detection. 4,489,167, Cl. 436-518.000.
O'Connor, James M.; Schnabel, Wilhelm J.; Rosin, Michael L.; and Early, Robert M., to Olin Corporation. Isocyanate-reactive compounds from TDI distillation residue and polyurethanes prepared therefrom. 4,489,177, Cl. 521-164.000.
Oda, Hiroyuki: *See*—
Itsubo, Junichi; and Oda, Hiroyuki, 4,488,655, Cl. 215-252.000.

Oda, Kazuhiro: *See*—
Watanabe, Masato; and Oda, Kazuhiro, 4,489,335, Cl. 346-140.00R.
O'Donnell, Matthew, to General Electric Company. Phase insensitive detector for use in ultrasonic scanner and method. 4,488,434, Cl. 73-602.000.
Odsgard, Peter, to Odsgard Reklame/Marketing ApS. Stand for supporting substantially conical objects as well as a carrier preferably for use in connection with this stand. 4,488,654, Cl. 312-39.000.
Odsgard Reklame/Marketing ApS: *See*—
Odsgard, Peter, 4,488,654, Cl. 312-39.000.
Oeser, Heinz-Gunter: *See*—
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Ogawa, Hiroshi, to Nippon Electric Co., Ltd. Stub type bandpass filter. 4,489,292, Cl. 333-202.000.
Ogawa, Kazuo: *See*—
Fujii, Setsuro; Hamakawa, Toshihiro; Ogawa, Kazuo; Muranaka, Yoshiyuki; and Hashimoto, Sadao, 4,489,091, Cl. 424-278.000.
Ogihara, Susumu, to Ogihara, Susumu. Method for molding plastic material by mechanical press. 4,489,031, Cl. 264-294.000.
Ogura, Eiji; Mito, Kunihiro; and Arai, Shoji, to Onoda Cement Co., Ltd.; and Toyo Soda Manufacturing Co., Ltd. Process for producing 2,2,2-trifluoroethanol. 4,489,211, Cl. 568-842.000.
Ohmori, Kaoru: *See*—
Nakagawa, Taizo; Matsumoto, Shozo; and Ohmori, Kaoru, 4,489,086, Cl. 424-273.00R.
Ohnishi, Eiichi: *See*—
Nagai, Tadashi; Ohnishi, Eiichi; Shioyama, Giichi; and Matsyoshi, Yutaka, 4,489,014, Cl. 261-44.00C.
Ohno, Jiro: *See*—
Gondo, Hisashi; Matsumoto, Ryutaro; Ohno, Jiro; and Suzuki, Ryoichi, 4,488,906, Cl. 75-123.00M.
Ohta, Kenji; and Takahashi, Akira, to Sharp Kabushiki Kaisha. Magneto-optic memory medium. 4,489,139, Cl. 428-621.000.
Ohta, Wasaburo, to Ricoh Company, Ltd. Information recording method and apparatus. 4,489,332, Cl. 346-74.200.
Ohtsuki, Naoto. Typewriter for braille symbols and printed characters. 4,488,828, Cl. 400-82.000.
Ohtsuki, Zenju: *See*—
Inami, Mamoru; Ohtsuki, Zenju; and Tanaka, Yoshiaki, 4,489,353, Cl. 360-25.000.
Oka, Tetsuo: *See*—
Katsumata, Ryoichi; Oka, Tetsuo; and Furuya, Akira, 4,489,160, Cl. 435-253.000.
Okabe, Kazuo: *See*—
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Okabe, Masao: *See*—
Sugio, Akitoshi; Masu, Masanobu; Okabe, Masao; and Ukita, Eiji, 4,489,186, Cl. 524-151.000.
Okada, Takashi, to Sony Corporation. Video brightness control circuit. 4,489,349, Cl. 358-168.000.
Okado, Hiroyuki: *See*—
Masuda, Shigeru; Okado, Hiroyuki; and Mori, Teijiro, 4,489,225, Cl. 200-144.00R.
Okamoto, Atsutoshi: *See*—
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Okaniwa, Tetsuo: *See*—
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Okazaki, Kazuyuki: *See*—
Nishida, Toshiaki; Okazaki, Kazuyuki; Kakumoto, Hideki; and Ikeda, Tatsuji, 4,488,529, Cl. 123-438.000.
Oki Electric Industry Co., Ltd.: *See*—
Ueda, Jun; Mori, Haruo; Hagimura, Kazuo; Tsukada, Hirokazu; and Kato, Kotaro, 4,489,340, Cl. 357-38.000.
Okimoto, Haruo: *See*—
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Morifuji, Kazuhiko; Okura, Hirohumi; and Sakai, Takashi, 4,488,563, Cl. 131-336.000.
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O'Leary, Kevin J.: *See*—
Fenn, Robert W., III; Pless, Emory J.; Harris, Richard L.; and O'Leary, Kevin J., 4,489,025, Cl. 264-104.000.
Olga Company: *See*—
Johnson, C. Erteszek, 4,488,314, Cl. 2-23.000.
Olin Corporation: *See*—
Miles, Ronald C., 4,488,947, Cl. 204-98.000.
O'Connor, James M.; Schnabel, Wilhelm J.; Rosin, Michael L.; and Early, Robert M., 4,489,177, Cl. 521-164.000.
Oliver, Stewart W., to International Teldata II Corp. Test set. 4,489,220, Cl. 179-2.0AM.
Olivier, Michel, to Alsthom-Atlantique. Electric machine rotor having a laminated and segmented rim. 4,489,249, Cl. 310-216.000.
Olivieri, Roberto; Eletti Bianchi, Giancarlo; Fascetti, Eugenio; Centini, Felice; Degen, Ludwig; and Marconi, Walter, to E.N.I. Nazionale Idrocarburi. Process for producing D(−)mandelic acid. 4,489,208, Cl. 562-470.000.
Olmer, Leonard J.; and Shanefield, Daniel J., to AT&T Technologies, Inc. Radiation-stimulated deposition of aluminum. 4,489,102, Cl. 427-54.100.
Olympus Optical Co., Ltd.: *See*—
Kimura, Kenji, 4,489,350, Cl. 358-213.000.
Nakamura, Toshiaki; and Miyabayashi, Nobuhiro, 4,488,700, Cl. 248-633.000.
Yamamoto, Kimiaki, 4,488,775, Cl. 350-164.000.
OMI International Corporation: *See*—
Martin, Sylvia; and Herr, R. Wilbur, 4,488,942, Cl. 204-44.200.
O'Neill, Justin T. Foam-barrier-foam-facing acoustical composite. 4,488,619, Cl. 181-290.000.
Ono, Masaaki; Motegi, Masahiko; and Okabe, Kazuo, to Toray Industries, Inc. Super high density magnetic recording medium. 4,489,117, Cl. 428-147.000.
Onoda Cement Co., Ltd.: *See*—
Ogura, Eiji; Mito, Kunihiro; and Arai, Shoji, 4,489,211, Cl. 568-842.000.
O'Quinn, Roger L.: *See*—
Herron, Charles R.; Haines, Marvin L.; and O'Quinn, Roger L., 4,489,367, Cl. 362-311.000.
Orlov, Vladimir M.: *See*—
Karmyshin, Nikolai V.; Kudryashov, Evgeny I.; Orlov, Vladimir M.; Levashov, Vladimir M.; Khorin, Vladimir N.; and Antonov, Alexandr D., 4,488,757, Cl. 299-32.000.
Orner, Richard L., Jr.; and Smith, Charles W., to Allis-Chalmers Corporation. Apparatus for measuring rotational velocity of a shaft. 4,489,273, Cl. 324-166.000.
Osawa, Masami, to Kino Precision Industries, Ltd. Photographic lens with variable range focus adjustment between selected end limits. 4,488,787, Cl. 350-429.000.
Ostertag, Karl, to Akzona Incorporated. Apparatus for the production of a continuous composite material. 4,488,929, Cl. 156-553.000.
Ota, Masaki: *See*—
Ikeda, Masashi; Tokumaru, Yukuya; Nakai, Masanori; and Ota, Masaki, 4,489,247, Cl. 307-477.000.
Otsuji, Masahiko: *See*—
Nishihama, Takamichi; and Otsuji, Masahiko, 4,488,803, Cl. 355-28.000.
Outhwaite, Stephen J., to Fairchild Weston Systems, Inc. Method for calibrating scintillation crystal. 4,489,236, Cl. 250-252.100.
Owatari, Akio, to Epson Corporation. Immersible oxygen absorbing capsule for ink jet fluid supply. 4,489,334, Cl. 346-104.00R.
Owens-Corning Fiberglas Corporation: *See*—
Black, Denny E.; and Garrett, David W., 4,489,131, Cl. 428-391.000.
Grubka, Lawrence J.; and Fracker, Clarence E., Jr., 4,488,891, Cl. 65-2.000.
Owens, Kenneth B.: *See*—
Dilgren, Richard E.; and Owens, Kenneth B., 4,488,976, Cl. 252-8.55D.
Oy Wiik & Hoglund AB: *See*—
Jofs, Jarl-Erik, 4,488,918, Cl. 156-79.000.
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Middlebrook, Terence C., 4,489,187, Cl. 524-201.000.
Schirmer, Robert M.; and Alquist, Henry E., 4,488,866, Cl. 431-4.000.
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Philp, Joseph T. Vacuum bag cleaning system. 4,488,883, Cl. 55-311.000.
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Polacco, Giorgio. Platform structure of the pallet type. 4,488,496, Cl. 108-51.300.
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Polk, Matthew S., to Polk Audio, Inc. Method and apparatus for reproducing sound having a realistic ambient field and acoustic image. 4,489,432, Cl. 381-24.000.
Pollington, Bernard M. Rotary cutting tool. 4,488,840, Cl. 408-231.000.
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Postle, Stephen R.; and Kingston, Samuel B., to Ciba-Geigy AG. Photochromic assembly and manufacture of this assembly. 4,489,108, Cl. 427-164.000.

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Claassen, George B.; Karlo, Rudolph A.; and Zimmerman, William B., 4,488,893, Cl. 65-287.000.
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Preble, John M.; Anderson, John A.; and McGee, Lawrence D., to Sundstrand Corporation. Hydraulic power supply with hermetic sealing of hydraulic fluid and sealing method. 4,488,856, Cl. 417-409.000.

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Preusser, Gerhard; Richter, Klaus; and Schulze, Martin, to Krupp-Koppers GmbH. Heat input control of an extractive distillation column. 4,488,936, Cl. 203-1.000.

Price, Anthony G.; and Campbell, Roy, to Lucas Industries Limited. Master cylinder assembly for a vehicle hydraulic braking system. 4,488,405, Cl. 60-581.000.

Price, Richard, to Sloan-Kettering for Cancer Research. Quantitative autoradiographic mapping of focal herpes simplex virus encephalitis using a radiolabeled antiviral drug. 4,489,052, Cl. 424-1.100.

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Pulliam, Daniel L.; Evans, John A.; Wilbur, David L.; and Fox, Robert D., to Atlantic Richfield Company. Multi-layer aluminum alloy brazing sheet. 4,489,140, Cl. 428-654.000.

Putkar, Victor, to ASARCO Incorporated. Process for applying latex rubber coatings to asbestos-cement products. 4,489,109, Cl. 427-230.000.

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Putman, Richard E., to Westinghouse Electric Corp. Industrial process control apparatus and method. 4,489,376, Cl. 364-165.000.

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Rado, Theodore A., to Kerr-McGee Chemical Corporation. Recovery of by-product calcium chloride from chlorination of titaniferous ores. 4,489,045, Cl. 423-79.000.

Ramming, John E., to JR3, Inc. Apparatus for simultaneous measurement of mutually perpendicular forces and moments. 4,488,441, Cl. 73-862.040.

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Rau, Jim L., to TRW Inc. Apparatus with staged pressure differential for controlling fluid flow. 4,488,569, Cl. 137-101.000.

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RCA Corporation: *See*—
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Reynolds, Harold D.: *See*—
Ebert, William S.; Reynolds, Harold D.; Sjostrom, William J.; and Strollo, Robert R., 4,488,684, Cl. 239-222.000.
Rheem Manufacturing Company: *See*—
Daugirda, Paul G., 4,488,342, Cl. 29-157.30R.
Rhodes, Richard R., to United States of America, Army. Area multiplier. 4,488,491, Cl. 102-522.000.
Rhone-Poulenc Inc.: *See*—
Gradeff, Peter S.; and Schreiber, Fred G., 4,489,000, Cl. 260-429.200.
Rhythm Watch Co., Ltd.: *See*—
Takebe, Katsuhiko, 4,488,820, Cl. 368-273.000.
Riblet, Gordon P. Reflection coefficient measurements. 4,489,271, Cl. 324-58.00B.
Richmond, Robert L.; Corrigan, John E.; and Wyar, Paul F., to M/A-COM DCC, Inc. Apparatus for controlling the receive and transmit frequency of a transceiver. 4,489,413, Cl. 370-30.000.
Richter, Klaus: *See*—
Preusser, Gerhard; Richter, Klaus; and Schulze, Martin, 4,488,936, Cl. 203-1.000.
Ricoh Company, Ltd.: *See*—
Chang, Shaw-Ping; and Shieh, Paul, 4,489,150, Cl. 430-106.000.
Fujioka, Yoshinato, 4,488,788, Cl. 350-465.000.
Haganuma, Tomoyuki, 4,488,827, Cl. 400-17.000.
Ohta, Wasaburo, 4,489,332, Cl. 346-74.200.
Riddle, David: *See*—
Dolgow, Joanne; and Riddle, David, 4,488,794, Cl. 354-83.000.
Riew, Changkiu K., to B. F. Goodrich Company, The. Hydroxyl-terminated liquid polymers. 4,489,008, Cl. 260-465.400.
Riley, James E.: *See*—
Jacobs, Anthony S.; Riley, James E.; and Christman, Jon D., 4,488,737, Cl. 281-31.000.
Rion Kabushiki Kaisha: *See*—
Marutake, Yozo; Fukutome, Tatsuro; Asami, Motomu; and Motohashi, Hideo, 4,489,330, Cl. 343-742.000.
Rios, Joe: *See*—
Velazquez, Angel M.; Vivas, Eduardo N.; and Rios, Joe, 4,488,352, Cl. 29-741.000.
Ritter, Friedhelm, to Raychem Corporation. Flat electrical cable. 4,488,763, Cl. 339-17.00F.
Rivier, Catherine L.; Rivier, Jean E. F.; and Vale, Wylie W., Jr., to Salk Institute for Biological Studies, The. Treatment of male mammals. 4,489,061, Cl. 424-177.000.
Rivier, Jean E. F.; Spiess, Joachim; and Vale, Wylie W., Jr., to Salk Institute for Biological Studies, The. rCRF and analogs. 4,489,163, Cl. 436-86.000.
Rivier, Jean E. F.: *See*—
Rivier, Catherine L.; Rivier, Jean E. F.; and Vale, Wylie W., Jr., 4,489,061, Cl. 424-177.000.
Rixon, Inc.: *See*—
Stuart, Richard L., 4,489,416, Cl. 375-13.000.
Riyono, Mikio, to Nippon Electric Co., Ltd. Automatic gain control amplifier left at an optimum gain after an end of a digital input signal. 4,489,281, Cl. 330-129.000.
Robert A. Denton, Inc.: *See*—
Denton, Robert A.; and Morgan, Craig R., 4,488,433, Cl. 73-432.00R.
Robert Bosch GmbH: *See*—
Gast, Theodor; Binder, Kurt; and Honig, Gunter, 4,488,439, Cl. 73-861.180.
Jonner, Wolf-Dieter; Korasiak, Wolfgang; and Leiber, Heinz, 4,489,382, Cl. 364-426.000.
Roberts, David: *See*—
Changani, Pushpkumar D.; Peacock, Donald G.; and Roberts, David, 4,488,642, Cl. 206-345.000.
Roberts, David A.: *See*—
Campbell, Simon F.; Roberts, David A.; and Stubbs, John K., 4,489,075, Cl. 424-246.000.
Robertshaw Controls Company: *See*—
Scott, Douglas R.; Payne, Frank; and Ailor, Roscoe M., 4,488,341, Cl. 29-156.40R.
Robey, Charles W.; and Bennett, Harry W., to Rolls-Royce Limited. Propfan aircraft propulsion engine. 4,488,399, Cl. 60-262.000.
Robyn, Pierre; and Deschepper, Pierre, to Glaverbel. Forming coherent refractory masses. 4,489,022, Cl. 264-30.000.
Rock, Erich, to Julius Blum Gesellschaft m.b.H. Drawer guide assembly. 4,488,762, Cl. 312-348.000.
Rockwell International Corporation: *See*—
Nicholson, Margie M., 4,488,780, Cl. 350-320.000.
Rodime Limited: *See*—
White, James N. J.; Ruxton, David S.; and Stewart, Alec D., 4,489,259, Cl. 318-696.000.
Roland, Michel: *See*—
Couvreur, Patrick; Roland, Michel; and Speiser, Peter, 4,489,055, Cl. 424-7.100.
Rolls-Royce Limited: *See*—
Hill, Anthony D.; Ford, David A.; Goulette, Michael J.; and Arthey, Roger P., 4,488,915, Cl. 148-404.000.
Robey, Charles W.; and Bennett, Harry W., 4,488,399, Cl. 60-262.000.
Rooke, Robert J.; Skierski, James E.; and Brockie, Raymond V., to Frito-Lay, Inc. Device for cutting continuous logs of dough. 4,488,464, Cl. 83-99.000.
Rose, David L.: *See*—
Williams, Joy L.; Rose, David L.; and Haas, Louis M., 4,488,958, Cl. 209-2.000.
Roshan, Natalia R.; Parfenova, Natalia I.; Polyakova, Viktoria P.; Savitsky, Evgeny M.; Mischenko, Alexandr P.; Gryaznov, Vladimir M.; and Sarylova, Maria E. Palladium-based alloy. 4,489,039, Cl. 420-463.000.
Rosin, Michael L.: *See*—
O'Connor, James M.; Schnabel, Wilhelm J.; Rosin, Michael L.; and Early, Robert M., 4,489,177, Cl. 521-164.000.
Rossini, Aldo A.; Mordes, John P.; Leeman, Susan E.; Carraway, Robert E.; and Ruane, Susan E. Anorexigenic composition and method. 4,489,059, Cl. 424-106.000.
Rossman, John A.: *See*—
Wolf, Theodore L.; Rossman, John A.; Quinn, Russell C.; and Kish, Thomas J., 4,488,422, Cl. 72-377.000.
Rossnik, Heinz: *See*—
Lehmann, Heinz; Rossnik, Heinz; and Blumenthal, Reinhard, 4,488,732, Cl. 280-781.000.
Roth, Peter H.: *See*—
Oberhauser, David F.; and Roth, Peter H., 4,489,152, Cl. 430-229.000.
Roth, Ulrich: *See*—
Drexler, Hermann-Josef; Ebner, Franz; Hille, Hans-Dieter; and Roth, Ulrich, 4,489,135, Cl. 428-423.100.
Roussel Uclaf: *See*—
Martel, Jacques; Tessier, Jean; and Teche, Andre , 4,489,093, Cl. 424-304.000.
Rozniecki, Edward J., to United States of America, Army. Portable light-beam projector locating device, system. 4,489,366, Cl. 362-270.000.
Ruane, Susan E.: *See*—
Rossini, Aldo A.; Mordes, John P.; Leeman, Susan E.; Carraway, Robert E.; and Ruane, Susan E., 4,489,059, Cl. 424-106.000.
Rudelstorfer, Rudolf: *See*—
Simbruner, Georg; and Rudelstorfer, Rudolf, 4,488,558, Cl. 128-642.000.
Rudi, Guttorm, to Tandberg Data A/S. Locking device for a magnetic tape cassette in a magnetic tape device. 4,489,355, Cl. 360-96.500.
Ruedin, Yves: *See*—
Saurer, Eric; Gharadjedaghi, Fereydoun; and Ruedin, Yves, 4,488,818, Cl. 368-71.000.
Ruhe, Rodney C. Solar/microwave vacuum continuous feed distillation apparatus. 4,488,935, Cl. 202-177.000.
Rumble, Ray M., to Michigan Hanger Company, Inc. Pipe hanger. 4,488,695, Cl. 248-62.000.
Runyan, Gary L.; and Sloan, Paul H., Jr., to Nibco Inc. Apparatus for preventing thermal damage to a preformed plug during molding of a housing therearound. 4,488,573, Cl. 137-375.000.
Runzi, Kurt. Sheet-by-sheet feeder with reflex photo cell line feed control. 4,488,830, Cl. 400-636.000.
Ruppel, Mark G.: *See*—
Ruppel, Richard W.; and Ruppel, Mark G., 4,488,605, Cl. 175-18.000.
Ruppel, Richard W.; and Ruppel, Mark G. Extendible shank auger. 4,488,605, Cl. 175-18.000.

Rusay, Ronald J., to Stauffer Chemical Company. Dichloromethyl oxadiazole herbicide antidotes. 4,488,897, Cl. 71-92.000.

Russell, Terrance J.: *See*—
Kammin, Marvin R.; and Russell, Terrance J., 4,489,122, Cl. 428-212.000.

Russello, Thomas: *See*—
Sangiamo, Richard; and Russello, Thomas, 4,489,368, Cl. 362-368.000.

Ruthardt, Rolf, to Leybold-Heraeus GmbH. Apparatus for manufacturing powder by dividing a melt. 4,488,859, Cl. 425-6.000.

Rutt, Truman C.: *See*—
Scrantom, Dehart G.; and Rutt, Truman C., 4,488,870, Cl. 432-11.000.

Rutz, Richard F., to International Business Machines Corporation. Structure containing epitaxial crystals on a substrate. 4,489,128, Cl. 428-332.000.

Ruxton, David S.: *See*—
White, James N. J.; Ruxton, David S.; and Stewart, Alec D., 4,489,259, Cl. 318-696.000.

Ryan, Philip M.: *See*—
Lavallee, Russell W.; Ryan, Philip M.; and Sollitto, Vincent F., Jr., 4,489,381, Cl. 364-200.000.

Saar, David A.; and Bhagwat, Pradeep M., to Black & Decker Inc. Waveform synthesizer and motor controller. 4,489,267, Cl. 318-811.000.

Sacco, William J.: *See*—
Lamb, David E.; Long, William B.; and Sacco, William J., 4,489,387, Cl. 364-514.000.

Sachenik, Paul A.: *See*—
Borrelli, Nicholas F.; Elmer, Thomas H.; Morse, David L.; and Sachenik, Paul A., 4,488,864, Cl. 430-13.000.

Sadaki, Hiroshi; Narita, Hirokazu; Imaizumi, Hiroyuki; Konishi, Yoshinori; Inaba, Takihiro; Hirakawa, Tatsuo; Taki, Hideo; Tai, Masaru; Watanabe, Yasuo; and Saikawa, Isamu, to Toyama Chemical Co., Ltd. Cephalosporins. 4,489,072, Cl. 424-246.000.

Saeda, Shigeru; and Izumi, Zenichiro, to Showa Denko K.K. Process for producing thermoplastic olefinic elastomer. 4,489,195, Cl. 525-323.000.

Saikawa, Isamu: *See*—
Sadaki, Hiroshi; Narita, Hirokazu; Imaizumi, Hiroyuki; Konishi, Yoshinori; Inaba, Takihiro; Hirakawa, Tatsuo; Taki, Hideo; Tai, Masaru; Watanabe, Yasuo; and Saikawa, Isamu, 4,489,072, Cl. 424-246.000.

Sainen, Tsutomu; and Fujita, Yoshitaka, to Tsudakoma Kogyo Kabushiki Kai'ha. Automatic method and apparatus for stopping loom rotation at a constant crank angle. 4,488,580, Cl. 139-336.000.

St. Clair, Terry L.; and Yamaki, David A., to United States of America, National Aeronautics and Space Administration. Process for preparing solvent resistant, thermoplastic aromatic poly(imidesulfone). 4,489,027, Cl. 264-137.000.

St. Clair, Terry L.: *See*—
Fox, Robert L.; Frizzill, Alan W.; Little, Bruce D.; Progar, Donald J.; Coultrip, Robert H.; Couch, Richard H.; Gleason, John R.; Stein, Bland A.; Buckley, John D.; and St. Clair, Terry L., 4,488,335, Cl. 24-304.000.

Saint Gobain Vitrage: *See*—
Halberschmidt, Friedrich; Audi, Josef; Radermacher, Herbert; and Uberwolf, Heinz, 4,488,846, Cl. 414-152.000.

Saito, Takashi; Miki, Tatsuya; and Kumaki, Takashi, to Victor Company of Japan, Ltd. Signal pickup device for disc reproducers. 4,489,409, Cl. 369-126.000.

Saitoh, Shinji; Miyamoto, Junichi; and Ichinose, Kazuaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor memory device. 4,489,402, Cl. 365-200.000.

Saitou, Norio: *See*—
Matsuda, Tadahito; Okubo, Tsuneo; Ozasa, Susumu; Saitou, Norio; and Yoda, Haruo, 4,489,241, Cl. 250-491.100.

Sakai, Akira, to Tokyo Kinzoku Kabushikikaisha. Device for releasably securing a finely angularly adjusted shaft. 4,488,450, Cl. 74-531.000.

Sakai, Takashi: *See*—
Morifuji, Kazuhiko; Okura, Hirohumi; and Sakai, Takashi, 4,488,563, Cl. 131-336.000.

Sakai, Toshiyasu: *See*—
Hara, Masahiro; Okamoto, Atsutoshi; and Sakai, Toshiyasu, 4,488,678, Cl. 235-463.000.

Sakakibara, Shinsuke: *See*—
Inaba, Hajimu; Sakakibara, Shinsuke; and Nihei, Ryo, 4,488,746, Cl. 294-86.00R.

Sakanoue, Kei; Hirano, Shigeo; and Adachi, Keiichi, to Fuji Photo Film Co., Ltd. Silver halide color photographic materials with diffusible dye for improving graininess. 4,489,155, Cl. 430-505.000.

Sakaue, Tatsuo: *See*—
Iida, Tetsuya; and Sakaue, Tatsuo, 4,489,245, Cl. 307-296.00R.

Sakurai, Masaki: *See*—
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; and Yoshihara, Kenji, 4,489,398, Cl. 369-32.000.

Salem, Robert J., to MIT Trading Corporation. Method and apparatus for precision temperature measurement. 4,488,824, Cl. 374-181.000.

Salk Institute for Biological Studies, The: *See*—
Rivier, Catherine L.; Rivier, Jean E. F.; and Vale, Wylie W., Jr., 4,489,061, Cl. 424-177.000.
Rivier, Jean E. F.; Spiess, Joachim; and Vale, Wylie W., Jr., 4,489,163, Cl. 436-86.000.

Salvat, Francois; Bouko, Jean; and Coquio, Claude, to Thomson-CSF. Two-band microwave antenna with nested horns for feeding a sub and main reflector. 4,489,331, Cl. 343-753.000.

Sancier, Kenneth M.; and Wood, Bernard J., to SRI International. High temperature sample heating for spectroscopic studies apparatus. 4,489,275, Cl. 324-315.000.

Sanders, Frederick W.; Hillenbrand, Gary F.; Arney, Jonathan S.; and Wright, Richard F., to Mead Corporation, The. Photosensitive material employing encapsulated radiation sensitive composition. 4,489,151, Cl. 430-138.000.

Sanderson, Robert W., III, to International Harvester Company. Starter solenoid terminal cover. 4,489,294, Cl. 335-209.000.

Sandweiss, Varda E.; Stupak, Elliot; and Shapiro, Paul H., to Schering Corporation. Betamethasone dipropionate cream. 4,489,070, Cl. 424-243.000.

Sangiamo, Richard; and Russello, Thomas. High intensity discharge light fixture. 4,489,368, Cl. 362-368.000.

Santen, Sven, to SKF Steel Engineering Aktiebolag. Method of recovering volatile metals from material containing metal oxides. 4,488,905, Cl. 75-89.000.

Santrade Ltd.: *See*—
Bergqvist, Sven A., 4,488,759, Cl. 299-81.000.
Wermeister, Gunter; and Noy, Josef, 4,488,839, Cl. 407-43.000.

Sanyo Electric Co., Ltd.: *See*—
Hosoya, Nobukazu, 4,489,343, Cl. 358-17.000.

Sarin, Vinod K., to GTE Laboratories, Inc. Mining drill. 4,488,609, Cl. 175-410.000.

Sarkkinen, Veli, to Flowcon Oy. Process for the preparation of lignosulfonate-based mixtures used in particular as additives of concrete. 4,488,907, Cl. 106-14.110.

Sarylova, Maria E.: *See*—
Roshan, Natalia R.; Parfenova, Natalia I.; Polyakova, Viktoria P.; Savitsky, Evgeny M.; Mischenko, Alexandr P.; Gryaznov, Vladimir M.; and Sarylova, Maria E., 4,489,039, Cl. 420-463.000.

Satake Engineering Co., Ltd.: *See*—
Satake, Toshihiko, 4,488,481, Cl. 99-517.000.

Satake, Toshihiko, to Satake Engineering Co., Ltd. Apparatus for producing rice of superhigh gloss. 4,488,481, Cl. 99-517.000.

Sato, Fumitaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Information processor. 4,489,395, Cl. 364-900.000.

Sato, Hiroshi: *See*—
Takahashi, Kazuo; Sato, Hiroshi; and Kosugi, Masao, 4,488,806, Cl. 355-77.000.

Sato, Shoji: *See*—
Ishige, Yoshiki; Kinugasa, Toshiyuki; and Sato, Shoji, 4,489,119, Cl. 428-167.000.

Sato, Tetsuo, to Hitachi, Ltd. Signal processing circuit employing an improved composite current mirror circuit/device. 4,489,285, Cl. 330-288.000.

Satou, Hiroshi: *See*—
Miura, Hirohisa; Satou, Hiroshi; and Natsume, Toshio, 4,488,904, Cl. 75-62.000.

Sauber, Charles J. Cable clamping device. 4,488,696, Cl. 248-74.100.

Saurer, Eric; Gharadjedaghi, Fereydoun; and Ruedin, Yves, to Asulab S.A. Watch with an analog display device the dial of which is formed by a liquid crystal display cell. 4,488,818, Cl. 368-71.000.

Savins, Joseph G.; and Johnson, Warren F., to Mobil Oil Corporation. Process for recovery of mineral values from subterranean formations. 4,489,042, Cl. 423-20.000.

Savitsky, Evgeny M.: *See*—
Roshan, Natalia R.; Parfenova, Natalia I.; Polyakova, Viktoria P.; Savitsky, Evgeny M.; Mischenko, Alexandr P.; Gryaznov, Vladimir M.; and Sarylova, Maria E., 4,489,039, Cl. 420-463.000.

Sawazaki, Norikazu, to Tokyo Shibaura Denki Kabushiki Kaisha. Electrostatic voltage detecting device. 4,489,278, Cl. 324-457.000.

Schaeffer, John L., to Brunswick Corporation. Filter pleat support means. 4,488,966, Cl. 210-485.000.

Schaffner, Jean-Claude, to ETA S.A., Fabriques d'Ebauches. Electronic watch movement with modular stepper motor and setting mechanism. 4,488,819, Cl. 368-220.000.

Schaming, Edward J., to Schaming Industries, Inc. Electronic strip oiler. 4,488,505, Cl. 118-630.000.

Schaming Industries, Inc.: *See*—
Schaming, Edward J., 4,488,505, Cl. 118-630.000.

Schat, Hermannus: *See*—
Gollinger, Wolfgang; Schat, Hermannus; Holzmann, Dieter; Elmis, Herbert; Struthoff, Holger; and Kunz, Detlev, 4,489,342, Cl. 358-17.000.

Schaum-Chemie W. Bauer GmbH & Co KG: *See*—
Baumann, Heinz; and Baumann, Rembert, 4,489,175, Cl. 521-116.000.

Scherer, Michael; and Kubacha, Karl-Heinz, to Leybold-Heraeus GmbH; and Glyco-Metal Werke. High-power cathode system for producing multilayers. 4,488,956, Cl. 204-298.000.

Schering Aktiengesellschaft: *See*—
Vorbruggen, Helmut; Schwarz, Norbert; Loge, Olaf; and Elger, Walter, 4,489,092, Cl. 424-304.000.

Schering Corporation: *See*—
Florance, Richard K.; and Sequeira, Joel A., 4,489,071, Cl. 424-243.000.
Sandweiss, Varda E.; Stupak, Elliot; and Shapiro, Paul H., 4,489,070, Cl. 424-243.000.

Schiewe, Herbert L. Emergency elevator. 4,488,621, Cl. 187-70.000.

Schijve, Jacobus; Vogelesang, Laurens B.; and Marissen, Roelof, to Technische Hogeschool Delft. Laminate of metal sheet material and threads bonded thereto, as well as processes for the manufacture thereof. 4,489,123, Cl. 428-213.000.

Schilling, William F., to Raytheon Company. Fluid mixer arrangement. 4,488,582, Cl. 141-95.000.

Schirmer, Robert M.; and Alquist, Henry E., to Phillips Petroleum Company. Method and apparatus for burning high nitrogen-high sulfur fuels. 4,488,866, Cl. 431-4.000.

Schlig, Eugene S., to International Business Machines Corporation. Pipelined charge coupled to analog to digital converter. 4,489,309, Cl. 340-347.0AD.

Schlumberger Technology Corporation: *See*—
Hoppe, Joachim A.; and Simmons, Ralph L., 4,488,597, Cl. 166-250.000.

Schmidlkofer, Jakob: *See*—
von Au, Gunter; Innertsberger, Ernst; Schmidlkofer, Jakob; and Kaiser, Wolfgang, 4,489,201, Cl. 528-42.000.

Schmidt, George E., Jr., to RCA Corporation. Closed-loop magnetic roll/yaw control system for high inclination orbit satellites. 4,489,383, Cl. 364-434.000.

Schmidt, Richard J.: *See*—
Ali Khan, Mir I.; and Schmidt, Richard J., 4,488,928, Cl. 156-495.000.

Schmidt, Robert R.: *See*—
Stetter, Jorg; Ditgens, Klaus; Thomas, Rudolf; Eue, Ludwig; and Schmidt, Robert R., 4,488,895, Cl. 71-90.000.

Schmidt, Victor P. Supporting pipe clamp. 4,488,388, Cl. 52-221.000.

Schmiegel, Walter W., to Du Pont de Nemours, E. I., and Company. Curable fluoropolymer composition. 4,489,196, Cl. 525-326.300.

Schmittmann, Hans-Bernd; and Muller, Samuel, to Dr. H. Schmittmann GmbH. A compact and highly mobile fire-fighting vehicle. 4,488,603, Cl. 169-24.000.

Schnabel, Wilhelm J.: *See*—
O'Connor, James M.; Schnabel, Wilhelm J.; Rosin, Michael L.; and Early, Robert M., 4,489,177, Cl. 521-164.000.

Schnegg, Ulrich: *See*—
Judat, Helmut; Schnegg, Ulrich; and Wedemeyer, Karlfried, 4,489,210, Cl. 568-779.000.

Schoenberg, Jules E. Carbinol-containing polyimides capable of self-crosslinking at low temperature. 4,489,185, Cl. 524-104.000.

Schoenemann, William M., Jr.: *See*—
Hutchins, Erle M.; and Schoenemann, William M., Jr., 4,488,355, Cl. 29-882.000.

Schoenenberger, Raymond: *See*—
Criblez, Roger; and Schoenenberger, Raymond, 4,488,420, Cl. 72-128.000.

Schoffl, Rainer, to Dynamit Nobel Aktiengesellschaft. Ordnance system having a warhead with secondary elements as a payload. 4,488,489, Cl. 102-489.000.

Scholes, Gary, to Shell Oil Company. Process for the preparation of cyclopropane compounds. 4,489,005, Cl. 260-430.000.

Scholin, Harold G.: *See*—
Heesch, Max O.; and Scholin, Harold G., 4,488,754, Cl. 297-216.000.

Scholz, Donald T.; and Miller, Neil A., to Scholz Research & Development. Electronic stereo reverberation device with doubler. 4,489,439, Cl. 381-63.000.

Scholz Research & Development: *See*—
Scholz, Donald T.; and Miller, Neil A., 4,489,439, Cl. 381-63.000.

Scholz, Walter: *See*—
Foerg, Wolfgang; Scholz, Walter; and Marold, Freimut, 4,488,890, Cl. 62-17.000.

Schoneberg, Wilfried: *See*—
Quambusch, Albert; and Schoneberg, Wilfried, 4,488,419, Cl. 72-95.000.

Schopper, Bernd; Tandler, Peter; and Lowe, Derek, to ITT Industries, Inc. Connecting arrangement, especially for tubular elements. 4,488,742, Cl. 285-325.000.

Schreck, Ronald P.: *See*—
Light, Kenneth K.; Schreiber, William L.; McGhie, Joseph A.; Schreck, Ronald P.; Yoshida, Takao; Schreiber, Loren B.; and Muralidhara, Ranya, 4,489,009, Cl. 260-465.600.

Schreiber, Fred G.: *See*—
Gradeff, Peter S.; and Schreiber, Fred G., 4,489,000, Cl. 260-429.200.

Schreiber, Loren B.: *See*—
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Schreiber, William L.: *See*—
Light, Kenneth K.; Schreiber, William L.; McGhie, Joseph A.; Schreck, Ronald P.; Yoshida, Takao; Schreiber, Loren B.; and Muralidhara, Ranya, 4,489,009, Cl. 260-465.600.

Schuck, David B.: *See*—
Chan, Kasun K.; Erickson, Gerald J.; Schuck, David B.; and Stone, James W., 4,488,354, Cl. 29-830.000.

Schulein, Robert B.: *See*—
Anderson, Carl R.; Bevan, William R.; Schulein, Robert B.; and Smith, Alan D., 4,489,442, Cl. 381-81.000.

Schulke, Karl A., to Heraeus Quarzschmelze GmbH. Flange connection for quartz tubes. 4,488,743, Cl. 285-368.000.

Schulze, Martin: *See*—
Preusser, Gerhard; Richter, Klaus; and Schulze, Martin, 4,488,936, Cl. 203-1.000.

Schumacher, Ivo: *See*—
Muller, Hans; and Schumacher, Ivo, 4,488,965, Cl. 210-232.000.

Schurter AG: *See*—
Hollenstein, Peter; and Lindenmann, Alois, 4,489,300, Cl. 337-186.000.

Schwarz, Norbert: *See*—
Vorbruggen, Helmut; Schwarz, Norbert; Loge, Olaf; and Elger, Walter, 4,489,092, Cl. 424-304.000.

Schwarzmann, Matthias: *See*—
Krabetz, Richard; and Schwarzmann, Matthias, 4,489,170, Cl. 502-211.000.

Schwieker, Horst H., to U.S. Philips Corporation. X-Ray spot-film device. 4,489,428, Cl. 378-176.000.

Science Applications, Inc.: *See*—
Borgonovi, Giancarlo, 4,489,425, Cl. 378-72.000.

Scolari, John E., to Life Light Systems. Emergency signal. 4,489,306, Cl. 340-107.000.

Scott, Douglas R.; Payne, Frank; and Ailor, Roscoe M., to Robertshaw Controls Company. Method of making a fluid pressure actuator. 4,488,341, Cl. 29-156.40R.

Scrantom, Dehart G.; and Rutt, Truman C. Method for firing article or the like. 4,488,870, Cl. 432-11.000.

Scribner, Louie L., Jr.: *See*—
Stafford, Gery R.; and Scribner, Louie L., Jr., 4,489,141, Cl. 429-23.000.

Seal Tech Corp.: *See*—
Jones, William C., 4,488,466, Cl. 83-175.000.

Sealright Co, Inc.: *See*—
Smith, Ernest L.; and Kraft, Donald L., 4,488,658, Cl. 220-276.000.

Seeq Technology, Inc.: *See*—
Smarandoiu, George; and Perlegos, George, 4,489,401, Cl. 365-200.000.

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Seitz, Werner: *See*—
Polzer, Herwig W.; and Seitz, Werner, 4,488,778, Cl. 350-631.000.

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Kojima, Nobuyuki; and Sekigawa, Youichi, 4,488,536, Cl. 126-96.000.

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Sekine, Takashi: *See*—
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Pfister, Henry F., 4,489,313, Cl. 340-540.000.

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Florance, Richard K.; and Sequeira, Joel A., 4,489,071, Cl. 424-243.000.

Serota, Samuel, to United States of America, Agriculture. Rapid production of ispropenyl esters. 4,488,996, Cl. 260-410.90R.

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Shetler, Robert L.; Merritt, Robert; and Sethanant, Torsak, 4,488,455, Cl. 74-851.000.

Seton Company: *See*—
Cioca, Gheorghe, 4,489,100, Cl. 426-422.000.

Setzer, Drel: *See*—
Hooper, Sonne L.; and Setzer, Drel, 4,488,663, Cl. 222-43.000.

SGS-ATES Componenti Elettronici S.p.A.: *See*—
Pansana, Pierangelo, 4,488,931, Cl. 156-643.000.

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Olmer, Leonard J.; and Shanefield, Daniel J., 4,489,102, Cl. 427-54.100.

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Sandweiss, Varda E.; Stupak, Elliot; and Shapiro, Paul H., 4,489,070, Cl. 424-243.000.

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Hashimoto, Shintaro; and Tanimoto, Akira, 4,489,396, Cl. 364-900.000.
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Minami, Yasuo, 4,488,783, Cl. 350-357.000.
Nishiguchi, Takuji; and Yoshimoto, Hideo, 4,488,641, Cl. 206-320.000.
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Lamarche, Fredrick W., 4,489,227, Cl. 200-314.000.

Shell Oil Company: *See*—
Davison, Sol, 4,489,034, Cl. 264-331.150.
Dilgren, Richard E.; and Owens, Kenneth B., 4,488,976, Cl. 252-8.55D.
Goolsby, Alvin D., 4,489,277, Cl. 324-425.000.
Johnson, Thomas H., 4,489,171, Cl. 502-231.000.
Johnson, Thomas H., 4,489,212, Cl. 568-628.000.
Scholes, Gary, 4,489,005, Cl. 260-430.000.

Shen, S. Nancy, to Sherwood Medical Company. Catheter placement device. 4,488,545, Cl. 128-200.260.

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Petersen, Kurt E.; Squires, Thomas E.; and Shepherd, Charles G., 4,489,015, Cl. 261-92.000.
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Shepherd, Robert G.: *See*—
DeVries, Vern G.; and Shepherd, Robert G., 4,489,090, Cl. 424-275.000.
Sherwin-Williams Company, The: *See*—
Karickhoff, Michael, 4,489,174, Cl. 521-54.000.
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Agdanowski, Ronald T., 4,488,548, Cl. 128-204.250.
Shen, S. Nancy, 4,488,545, Cl. 128-200.260.
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Shichman, Daniel, to United States Surgical Corporation. Flexible, hydraulically actuated device for applying surgical fasteners. 4,488,523, Cl. 128-334.00R.
Shieh, Paul: *See*—
Chang, Shaw-Ping; and Shieh, Paul, 4,489,150, Cl. 430-106.000.
Shiga, Seiji, to International Business Machines Corporation. Cathode ray tube apparatus. 4,489,317, Cl. 340-726.000.
Shih, Yen-Jer; and Iovine, Carmine P., to National Starch and Chemical Corporation. Cationic vinyl ester based polymer latices, their preparation and use as formaldehyde-free binders. 4,489,192, Cl. 524-813.000.
Shilad, Isaac U.; and Bouscher, Lawrence E., to Parker-Hannifin Corporation. Fire resistant hose. 4,488,577, Cl. 138-127.000.
Shima Idea Center Co. Ltd.: *See*—
Shima, Masahiro; and Nishida, Hirozi, 4,488,416, Cl. 66-149.00R.
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Shima, Yoshiharu: *See*—
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Shimada, Hiroyuki: *See*—
Nishimura, Sadanori; Ishikawa, Keiichi; and Shimada, Hiroyuki, 4,488,457, Cl. 74-868.000.
Shimadzu Corporation: *See*—
Fukuma, Toshiaki, 4,488,811, Cl. 356-319.000.
Shimano Industrial Company Limited: *See*—
Nagano, Masashi, 4,489,307, Cl. 340-134.000.
Shimizu, Masami: *See*—
Iura, Yukio; Shimizu, Masami; Aizawa, Hiroshi; Tsunekawa, Tokuichi; Uchidoi, Masanori; and Yamamichi, Masayoshi, 4,488,800, Cl. 354-445.000.
Shimoyama, Tatsuo, to Hitachi Chemical Company, Ltd. Spherical bodies of carbon or graphite. 4,489,132, Cl. 428-408.000.
Shiomura, Tadayoshi: *See*—
Uda, Naotake; Kouno, Yasuo; and Shiomura, Tadayoshi, 4,489,033, Cl. 264-328.700.
Shioyama, Giichi: *See*—
Nagai, Tadashi; Ohnishi, Eiichi; Shioyama, Giichi; and Matayoshi, Yutaka, 4,489,014, Cl. 261-44.00C.
Shioyama, Masakazu: *See*—
Uenobe, Fukuji; Matsuura, Shin; Yamamoto, Nobuhiro; and Shioyama, Masakazu, 4,489,067, Cl. 424-195.000.
Shirai, Akira: *See*—
Arakawa, Susumu; Tsukigahora, Tooru; and Shirai, Akira, 4,488,404, Cl. 60-535.000.
Shiraishi, Tetsuo: *See*—
Aoyagi, Shoji; and Shiraishi, Tetsuo, 4,489,336, Cl. 346-209.000.
Shoketsu Kinzoku Kogyo Kabushiki Kaisha: *See*—
Miyamoto, Michikazu, 4,488,477, Cl. 92-85.00R.
Short, Robert D., III: *See*—
Bennett, Clarence L., Jr.; and Short, Robert D., III, 4,489,280, Cl. 328-139.000.
Showa Denko K.K.: *See*—
Saeda, Shigeru; and Izumi, Zenichiro, 4,489,195, Cl. 525-323.000.
Shpuntoff, Harry: *See*—
Bloomfield, Philip E.; and Shpuntoff, Harry, 4,488,873, Cl. 433-71.000.
Shue, Robert S.; and Jones, Faber B., to Phillips Petroleum Company. Polymer-coated reinforcements. 4,489,129, Cl. 428-366.000.
Shure Brothers, Inc.: *See*—
Anderson, Carl R.; Bevan, William R.; Schulein, Robert B.; and Smith, Alan D., 4,489,442, Cl. 381-81.000.
Siebentritt, Carl R.: *See*—
Kronenberg, Stanley; McLaughlin, William L.; and Siebentritt, Carl R., 4,489,240, Cl. 250-474.100.
Sieck, Charles A. Internal thermal exchanger engine. 4,488,402, Cl. 60-517.000.
Siemens Aktiengesellschaft: *See*—
Burger, Erich, 4,489,421, Cl. 375-112.000.
Feigl, Werner, 4,488,769, Cl. 339-103.00M.
Grassmann, Hans-Christian, 4,488,362, Cl. 34-1.000.
Kraicar, Heinz; and Ziegler, Alfred, 4,489,360, Cl. 361-187.000.
Sig. Societe Industrielle Suisse: *See*—
Ganz, Jorg, 4,488,492, Cl. 104-12.000.
Sigmon, Ned A., to AMP Incorporated. Programmable electrical connector. 4,488,768, Cl. 339-99.00R.
Sikorski, James A.; and Hoobler, Mary A., to Monsanto Company. Unsymmetrical aminosulfinamide derivatives of N-phosphonomethylglycinonitrile, herbicidal compositions and use. 4,488,894, Cl. 71-87.000.
Silvis, Salvatore J. Upwardly oriented stripping or rectification apparatus. 4,488,934, Cl. 202-158.000.
Simak, Petr: *See*—
Naarmann, Herbert; Simak, Petr; and Kohler, Gernot, 4,488,986, Cl. 252-500.000.
Simbruner, Georg; and Rudelstorfer, Rudolf, to Innova Wiener Innovationsgesellschaft m.b.H. Birth monitor. 4,488,558, Cl. 128-642.000.
Simmonds Precision Products, Inc.: *See*—
Parkinson, James R., 4,488,443, Cl. 73-862.330.
Simmons, Ralph L.: *See*—
Hoppe, Joachim A.; and Simmons, Ralph L., 4,488,597, Cl. 166-250.000.
Singer Company, The: *See*—
Giaimo, Anthony; and Zylbert, Thaddeus J., 4,488,499, Cl. 112-230.000.
Hicks, Irwin A., 4,488,566, Cl. 137-74.000.
Lackenbach, Elliot A., 4,488,329, Cl. 15-322.000.
Warner, Richard C., 4,489,290, Cl. 322-35.000.
Singh, Prithipal: *See*—
Khanna, Pyare; Snyder, Evan S.; and Singh, Prithipal, 4,489,156, Cl. 435-7.000.
Khanna, Pyare L.; Snyder, Evan S.; and Singh, Prithipal, 4,489,157, Cl. 435-7.000.
Sircar, Jagadish C.; and Capiris, Thomas, to Warner-Lambert Company. 3-Isoxa-zolyl-2H-1,2-benzothiazine-3-carboxamide, 1,1-dioxides. 4,489,077, Cl. 424-246.000.
Sjostedt, Ernst H. S. Method of cultivating plants without soil. 4,488,377, Cl. 47-59.000.
Sjostrom, William J.: *See*—
Ebert, William S.; Reynolds, Harold D.; Sjostrom, William J.; and Strollo, Robert R., 4,488,684, Cl. 239-222.000.
Skelly, Michael. Directional flow control valve. 4,488,576, Cl. 137-625.210.
SKF Steel Engineering Aktiebolag: *See*—
Santen, Sven, 4,488,905, Cl. 75-89.000.
Skierski, James E.: *See*—
Rooke, Robert J.; Skierski, James E.; and Brockie, Raymond V., 4,488,464, Cl. 83-99.000.
Skinner, James R., to M.U. Engineering & Manufacturing Inc. Plastic lens cell. 4,488,776, Cl. 350-242.000.
Skotheim, Terje, to United States of America, Energy. Polymer blends for use in photoelectrochemical cells for conversion of solar energy to electricity and methods for manufacturing such blends. 4,488,943, Cl. 204-58.500.
Sladky, Hans H. Flow-control system with pressure-responsive valve. 4,488,571, Cl. 137-315.000.
Slag, Alexander H.: *See*—
DeGroot, Gerrit; and Slag, Alexander H., 4,489,388, Cl. 364-517.000.
Sloan-Kettering for Cancer Research: *See*—
Price, Richard, 4,489,052, Cl. 424-1.100.
Sloan, Norman R.; Remys, Dionizas; and Novy, Robert A., to Restaurant Technology, Inc. Portable apparatus for cooking eggs on a heated cooking surface. 4,488,479, Cl. 99-345.000.
Sloan, Paul H., Jr.: *See*—
Runyan, Gary L.; and Sloan, Paul H., Jr., 4,488,573, Cl. 137-375.000.
Slobodnik, Andrew J.; and Colvin, Roger D., to United States of America, Air Force. Saw oscillator with digital compensation for temperature related frequency changes. 4,489,289, Cl. 331-107.00A.
Smarandoiu, George; and Perlegos, George, to Seeq Technology, Inc. Electrical partitioning scheme for improving yields during the manufacture of semiconductor memory arrays. 4,489,401, Cl. 365-200.000.
Smaroglay, Peter: *See*—
Antal, Sandor; Smaroglay, Peter; and Lantos, Elemer, 4,489,021, Cl. 264-27.000.
Smart Start Corporation: *See*—
Puckett, William E.; and Adams, Ladd M., 4,489,223, Cl. 191-12.20R.
Smith, Alan D.: *See*—
Anderson, Carl R.; Bevan, William R.; Schulein, Robert B.; and Smith, Alan D., 4,489,442, Cl. 381-81.000.
Smith, Charles W.: *See*—
Orner, Richard L., Jr.; and Smith, Charles W., 4,489,273, Cl. 324-166.000.
Smith, Douglas D. Hay rack top. 4,488,565, Cl. 135-100.000.
Smith, Ernest L.; and Kraft, Donald L., to Sealright Co, Inc. Tamper evident food package. 4,488,658, Cl. 220-276.000.
Smith, Gary F.: *See*—
Fox, Daniel W.; Gallucci, Robert R.; Peters, Edward N.; and Smith, Gary F., 4,489,181, Cl. 523-219.000.
Smith, Gerald S.: *See*—
Looger, Lonnie L.; and Smith, Gerald S., 4,488,488, Cl. 102-387.000.
Smith International, Inc.: *See*—
Baugh, Benton F.; Henderson, Herman O., Jr.; Fowler, John H.; and Ahlstone, Arthur, 4,488,740, Cl. 285-84.000.
Smith, Jack E., to General Motors Corporation. Apparatus for producing decoratively stitched trim part. 4,488,498, Cl. 112-80.000.
Smith, Terence W.: *See*—
Lowe, Lawrence A.; Smith, Terence W.; and Wilkinson, Samuel, 4,489,062, Cl. 424-177.000.
SNAM S.p.A.: *See*—
Beltrami, Giovanni; and Formica, Fulvio, 4,488,867, Cl. 431-12.000.

Snedkerud, Ole, to BBC Brown, Boveri & Company, Limited. Process and a circuit arrangement for signal transmission using an amplitude-modulated radio broadcasting system. 4,489,411, Cl. 370-11.000.

Snider, C. Jennings. Combination toothbrush and tongue scraper. 4,488,327, Cl. 15-111.000.

Snoble, Karel A. J.: *See*—
Stutts, Kenneth J.; and Snoble, Karel A. J., 4,488,944, Cl. 204-79.000.

Snyder, Evan S.: *See*—
Khanna, Pyare; Snyder, Evan S.; and Singh, Prithipal, 4,489,156, Cl. 435-7.000.
Khanna, Pyare L.; Snyder, Evan S.; and Singh, Prithipal, 4,489,157, Cl. 435-7.000.

Snyder, William J.: *See*—
Kobayashi, Hisashi; and Snyder, William J., 4,488,682, Cl. 239-132.300.

Societe de Vente de l'Aluminium Pechiney: *See*—
Ferton, Daniel, 4,488,913, Cl. 148-12.70A.

Societe D'Etudes et de Developpement des Aeroglisseurs Marins, Terrestres et Amphibies (SEDAM): *See*—
Lafont, Andre ; Rabier, Michel; Guedon, Michel; and Herrouin, Guy, 4,488,614, Cl. 180-127.000.

Societe' Nationale Industrielle Aerospatial: *See*—
Aubry, Jacques A.; and Bonfils, Michel R., 4,488,736, Cl. 280-723.000.

Societe Nationale Industrielle Aerospatiale: *See*—
du Parc, Jacques G. M., 4,489,373, Cl. 363-56.000.

Societe Nationale Industrielle et Aerospatiale: *See*—
Vezain, Gerard; and Vermalle, Jean-Claude, 4,489,329, Cl. 343-705.000.

Soifer, Jack. Detachable mounting for a dental fixture and method for using same. 4,488,874, Cl. 433-173.000.

Sollitto, Vincent F., Jr.: *See*—
Lavallee, Russell W.; Ryan, Philip M.; and Sollitto, Vincent F., Jr., 4,489,381, Cl. 364-200.000.

Sone, Junichi, to Nippon Electric Co., Ltd. Frequency divider making use of Josephson junction circuits. 4,489,424, Cl. 377-93.000.

Sonofi: *See*—
Giudice, Antonina; Moulineau, Claude; Manara, Luciano; and Carminati, Paolo, 4,489,079, Cl. 424-260.000.

Sony Corporation: *See*—
Okada, Takashi, 4,489,349, Cl. 358-168.000.
Tanaka, Yutaka; and Isobe, Toshinobu, 4,489,346, Cl. 358-31.000.

Sound Attenuators Limited: *See*—
Chaplin, George B. B., 4,489,441, Cl. 381-71.000.

Soundararajan, Rengarajan, to Research Manufacturing Consultation Corporation. Method of desulphurization of coal. 4,488,952, Cl. 204-158.00R.

Southerland, Ebbin R., Jr., to Texas Instruments Incorporated. Serially banked read only memory. 4,489,400, Cl. 365-104.000.

SP, EL. s.r.l.: *See*—
Franzolini, Luciano, 4,489,266, Cl. 318-800.000.

Spamer, William S.: *See*—
Hinton, Teresa L.; and Spamer, William S., 4,488,652, Cl. 211-183.000.

Sparer, Randall V.: *See*—
Walton, Alan G.; Sparer, Randall V.; and Ekwuribe, Nnochiro, 4,489,065, Cl. 424-180.000.

Spaziante, Placido M., to Pancior S.A. Process for producing hypochlorite. 4,488,945, Cl. 204-95.000.

Spector, Marshall L.: *See*—
Hong, Sun-Nan; and Spector, Marshall L., 4,488,968, Cl. 210-605.000.

Speiser, Peter: *See*—
Couvreur, Patrick; Roland, Michel; and Speiser, Peter, 4,489,055, Cl. 424-7.100.

Spencer, Dudley W. C., to Du Pont de Nemours, E. I., and Company. One-way filter unit. 4,488,961, Cl. 210-136.000.

Speranza, George P.: *See*—
Brennan, Michael E.; and Speranza, George P., 4,489,178, Cl. 521-167.000.

Sperry Corporation: *See*—
Bennett, Clarence L., Jr.; and Short, Robert D., III, 4,489,280, Cl. 328-139.000.
De Coene, Frans J. G. C., 4,488,636, Cl. 198-608.000.
Goldberg, Norman, 4,489,363, Cl. 361-383.000.
Isenberg, Gerry E.; Forshey, Terry L.; and Keller, Robert D., Jr., 4,458,711, Cl. 266-276.000.
Mittal, Faquir C.; and Phillips, Edwin R., 4,488,592, Cl. 165-104.310.

Spiess, Joachim: *See*—
Rivier, Jean E. F.; Spiess, Joachim; and Vale, Wylie W., Jr., 4,489,163, Cl. 436-86.000.

Sprague Electric Company: *See*—
Love, Gordon R., 4,488,941, Cl. 204-15.000.
Mayrand, James F., 4,489,341, Cl. 357-51.000.

Spraymation, Inc.: *See*—
Cocks, Eric H.; and Griffin, Richard A., 4,488,665, Cl. 222-146.500.

Springer, Jeffery T.: *See*—
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Square D Company: *See*—
Lehman, Lewis M.; and Gribble, Joseph J., 4,488,767, Cl. 339-91.00R.

Squires, Thomas E.: *See*—
Petersen, Kurt E.; Squires, Thomas E.; and Shepherd, Charles G., 4,489,015, Cl. 261-92.000.

SRI International: *See*—
Sancier, Kenneth M.; and Wood, Bernard J., 4,489,275, Cl. 324-315.000.

Sriskandarajah, Thurairajah: *See*—
Tseung, Alfred C. C.; Chan, Ho C.; Fouzder, Nani B.; and Sriskandarajah, Thurairajah, 4,488,578, Cl. 138-146.000.

Staar S. A.: *See*—
d'Alayer de Costemore d'Arc, Stephane M., 4,489,351, Cl. 358-213.000.

Stafford, Gery R.; and Scribner, Louie L., Jr., to Celanese Corporation. Passive potentiostat. 4,489,141, Cl. 429-23.000.

Stained Glass Overlay, Inc.: *See*—
Butler, Donald R., 4,488,919, Cl. 156-153.000.

Stal Refrigeration AB: *See*—
Glanvall, Rune V., 4,488,858, Cl. 418-195.000.

Standard Oil Company, The: *See*—
Hammett, Robert E., 4,488,601, Cl. 166-270.000.
Mark, Seymour, 4,488,881, Cl. 44-51.000.

Standard Oil Company (Ohio), The: *See*—
Kuch, Philip L., 4,489,048, Cl. 423-416.000.

Stanley Works, The: *See*—
Whitehouse, Hugh L., 4,488,604, Cl. 173-12.000.

Statni vyzkumny ustav ochrany materialu G.V. Akimova: *See*—
Jirovsky, Ivan; Jojko, Zorjan; Kokoska, Ivan; Prusek, Jaroslav; and Trojan, Vaclav, 4,488,938, Cl. 204-1.00T.

Stauffer Chemical Company: *See*—
Felix, Raymond A., 4,489,007, Cl. 260-465.00F.
Goswami, Jagadish C., 4,489,193, Cl. 525-190.000.
Greco, Carl C., 4,489,004, Cl. 260-429.00R.
Rusay, Ronald J., 4,488,897, Cl. 71-92.000.
Teach, Eugene G.; and Springer, Jeffery T., 4,489,010, Cl. 260-501.110.

Ste Look: *See*—
Beyl, Jean J. A.; Bernard, Jean; Campillo, Christian; Guerreau, Rene ; le Faou, Daniel; and Peyre, Henri, 4,488,734, Cl. 280-605.000.

Steer, John E., to Bendix Corporation, The. Fluid level indicator. 4,489,224, Cl. 200-84.00C.

Stefani, Giancarlo: *See*—
Neri, Amleto; Capitanio, Lorenzo; and Stefani, Giancarlo, 4,489,204, Cl. 549-248.000.

Steighner, Harry J. Lathe tool aligning instrument and method for its use. 4,488,360, Cl. 33-185.00R.

Stein, Bland A.: *See*—
Fox, Robert L.; Frizzill, Alan W.; Little, Bruce D.; Progar, Donald J.; Coultrip, Robert H.; Couch, Richard H.; Gleason, John R.; Stein, Bland A.; Buckley, John D.; and St. Clair, Terry L., 4,488,335, Cl. 24-304.000.

Step Design: *See*—
Story, Thomas A.; and Peglow, Edward P., 4,488,729, Cl. 277-15.000.

Stern, Ronald C.: *See*—
Heinecke, Rudolf A. H.; Stern, Ronald C.; and Cooke, Michael J., 4,488,506, Cl. 118-667.000.

Stetter, Jorg; Ditgens, Klaus; Thomas, Rudolf; Eue, Ludwig; and Schmidt, Robert R., to Bayer Aktiengesellschaft. N-Diazolyalkylhaloacetanilide compounds and herbicidal compositions. 4,488,895, Cl. 71-90.000.

Stetter, Jorg; Buchel, Karl H.; Reinecke, Paul; Brandes, Wilhelm; and Frobberger, Paul-Ernst, to Bayer Aktiengesellschaft. Fungicidally active novel substituted azolylethyl oximinoalkyl ethers. 4,489,081, Cl. 424-269.000.

Stewart, Alec D.: *See*—
White, James N. J.; Ruxton, David S.; and Stewart, Alec D., 4,489,259, Cl. 318-696.000.

Stoka, Roberto, to ITT Industries, Inc. Spot-type floating-caliper disc brake. 4,488,622, Cl. 188-72.300.

Stokes, Vijay K., to General Electric Company. Supports for plastic motor vehicle bumpers. 4,488,745, Cl. 293-155.000.

Stolzer, Paul, to KEURO Maschinenbau Gesellschaft mit beschrankter Haftung & Co. Kommanditgesellschaft. Apparatus for storing rod-shaped material. 4,488,847, Cl. 414-222.000.

Stone, James W.: *See*—
Chan, Kasun K.; Erickson, Gerald J.; Schuck, David B.; and Stone, James W., 4,488,354, Cl. 29-830.000.

Stone, Roger L., to Procter & Gamble Company, The. Intravenous solutions with antimicrobial agent. 4,489,097, Cl. 424-318.000.

Storni, Angelo, to Ciba-Geigy AG. Substituted thiazolidinyl esters of mineral acids. 4,489,069, Cl. 424-202.000.

Story, Thomas A.; and Peglow, Edward P., to Step Design. Drill box. 4,488,729, Cl. 277-15.000.

Straus, Eugene W., to Montefiore Hospital and Medical Center, Inc. Binding assay for the detection of mycobacteria. 4,489,158, Cl. 435-7.000.

Streich, Gerhard; and Hummel, Karl-Ernst, to Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG. Electromagnetic two-stage clutch. 4,488,627, Cl. 192-48.200.

Strollo, Robert R.: *See*—
Ebert, William S.; Reynolds, Harold D.; Sjostrom, William J.; and Strollo, Robert R., 4,488,684, Cl. 239-222.000.

Struthoff, Holger: *See*—
Gollinger, Wolfgang; Schat, Hermannus; Holzmann, Dieter; Elmis, Herbert; Struthoff, Holger; and Kunz, Detlev, 4,489,342, Cl. 358-17.000.
Stuart, Richard L., to Rixon, Inc. Equalization system for modems in a polled arrangement. 4,489,416, Cl. 375-13.000.
Stubbs, John K.: *See*—
Campbell, Simon F.; Roberts, David A.; and Stubbs, John K., 4,489,075, Cl. 424-246.000.
Studenny, John, to Canadian Marconi Company. Time reference scanning beam microwave landing system. 4,489,326, Cl. 343-408.000.
Stumpf, Harry M.; and Woratyla, John A., to AMP Incorporated. Terminal alignment tool. 4,488,581, Cl. 140-147.000.
Stupak, Elliot: *See*—
Sandweiss, Varda E.; Stupak, Elliot; and Shapiro, Paul H., 4,489,070, Cl. 424-243.000.
Stutts, Kenneth J.; and Snoble, Karel A. J., to Dow Chemical Company, The. Electrocatalytic oxidation of (poly)alkylene glycols. 4,488,944, Cl. 204-79.000.
Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG: *See*—
Streich, Gerhard; and Hummel, Karl-Ernst, 4,488,627, Cl. 192-48.200.
Sueddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG: *See*—
Kluna, Vlastimil; and Hummel, Werner, 4,488,628, Cl. 192-58.00B.
Suehiro, Akio; and Ichikawa, Akira, to Hitachi, Ltd. Speech information transmission method and system. 4,489,433, Cl. 381-41.000.
Suenaga, Masaki; Klamut, Carl J.; and Luhman, Thomas S., to United States of America, Energy. A-15 Superconducting composite wires and a method for making. 4,489,219, Cl. 174-128.00S.
Sugier, Andre : *See*—
Le Boucher, Bernard; and Sugier, Andre , 4,489,137, Cl. 428-610.000.
Sugio, Akitoshi; Masu, Masanobu; Okabe, Masao; and Ukita, Eiji, to Mitsubishi Gas Chemical Company, Inc. Polyphenylene ether resin composition. 4,489,186, Cl. 524-151.000.
Sugiura, Kengo; Yamauchi, Yasutaka; and Ito, Hiroshi, to Nippondenso Co., Ltd.; and Toyota Jidosha Kabushiki Kaisha. Idling speed control for engines. 4,488,524, Cl. 123-339.000.
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; and Yoshihara, Kenji, to Victor Company of Japan, Ltd. Address indicator control device in a rotary recording medium reproducing apparatus. 4,489,398, Cl. 369-32.000.
Sulzer Brothers, Ltd.: *See*—
Lincke, Paul, 4,488,579, Cl. 139-196.200.
Sumida, Shizuo: *See*—
Nobumoto, Kazutoshi; and Sumida, Shizuo, 4,488,625, Cl. 192-3.580.
Sumitomo Chemical Company, Limited: *See*—
Ishiguru, Yukio; Takano, Hirotaka; and Funaki, Yuji, 4,489,082, Cl. 424-269.000.
Yamatsuta, Kohji; and Nishio, Ken-ichi, 4,489,138, Cl. 428-614.000.
Yoshinaga, Kenji; Hashimoto, Kiyoyasu; Okaniwa, Tetsuo; and Kenmochi, Hirohito, 4,488,992, Cl. 534-788.000.
Sumitomo Electric Industries, Ltd.: *See*—
Koe, Kiyohiko, 4,488,930, Cl. 156-616.00R.
Ueno, Keiji, 4,489,113, Cl. 428-36.000.
Sumitomo Rubber Industries, Ltd.: *See*—
Fujimoto, Mitsuru; Shima, Yoshiharu; Motooka, Hironobu; and Kikuchi, Minoru, 4,488,430, Cl. 73-146.000.
Sunaga, Ryuzo; and Joh, Seiji, to Fuji Xerox Co., Ltd. Electrophotographic device with single stations serving multiple functions. 4,488,802, Cl. 355-3.0CH.
Sundstrand Corporation: *See*—
Glennon, Timothy F.; Hucker, David J.; and Lenny, Charles M., 4,489,323, Cl. 363-87.000.
Preble, John M.; Anderson, John A.; and McGee, Lawrence D., 4,488,856, Cl. 417-409.000.
SuperTurf, Inc.: *See*—
Layman, Bruce W.; and Privett, Billy G., 4,489,115, Cl. 428-62.000.
Sutton, John R. Jacking apparatus. 4,488,705, Cl. 254-108.000.
Suzuki, Fumitaka: *See*—
Mizokawa, Takumi; and Suzuki, Fumitaka, 4,488,837, Cl. 406-34.000.
Suzuki, Hitoshi: *See*—
Ebata, Yasuo; Suzuki, Hitoshi; Matsumura, Sadao; and Fukuta, Katsuyoshi, 4,489,250, Cl. 310-313.00A.
Suzuki, Masaru, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Card key switch. 4,489,359, Cl. 361-172.000.
Suzuki, Nobuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Charge transfer type area image sensor with improved resolution and blooming suppression. 4,489,423, Cl. 377-58.000.
Suzuki, Ryoichi: *See*—
Gondo, Hisashi; Matsumoto, Ryutaro; Ohno, Jiro; and Suzuki, Ryoichi, 4,488,906, Cl. 75-123.00M.
Suzuki, Takashi; and Hosoe, Kazuya, to Canon Kabushiki Kaisha. Metering system using a focus detecting optical system. 4,488,799, Cl. 354-406.000.
Suzuki, Yasuo; and Hirao, Hiroshi, to Fujitsu Limited. Read-only memory device. 4,489,399, Cl. 365-104.000.
Suzuki, Yoshio: *See*—
Masuda, Naosuke; Suzuki, Yoshio; and Fujii, Tadaaki, 4,488,475, Cl. 91-462.000.
Umezawa, Yujiro; Suzuki, Yoshio; Miura, Teruo; and Kawasaki, Kiyohito, 4,488,587, Cl. 152-359.000.
Swallow, David H. Hydraulic column choke and reamer. 4,488,515, Cl. 122-379.000.
Swett, James B.; and Herlow, Erik, to Dart Industries Inc. Condiment shaker. 4,488,667, Cl. 222-485.000.
Swift, Stephen J.: *See*—
Nappholz, Tibor A.; and Swift, Stephen J., 4,488,553, Cl. 128-419.0PG.
Nappholz, Tibor A.; and Swift, Stephen J., 4,488,554, Cl. 128-419.0PG.
Swiss Aluminium Ltd.: *See*—
Baur, Rudolf, 4,488,979, Cl. 252-79.000.
Sybert, Edward M.: *See*—
Milch, Robert A.; Guerry-Kopecko, Patricia; Koeble-Smith, Carol; and Sybert, Edward M., 4,488,912, Cl. 127-41.000.
Symon, Ernest B., to Kawneer Company, inc. Building entrance. 4,488,378, Cl. 49-141.000.
Synek, Wenzel: *See*—
Rauch, Manfred; and Synek, Wenzel, 4,488,926, Cl. 156-379.800.
Syntex (U.S.A.) Inc.: *See*—
Walker, Keith A. M., 4,489,087, Cl. 424-273.00R.
Syva Company: *See*—
Khanna, Pyare; Snyder, Evan S.; and Singh, Prithipal, 4,489,156, Cl. 435-7.000.
Khanna, Pyare L.; Snyder, Evan S.; and Singh, Prithipal, 4,489,157, Cl. 435-7.000.
Tadokoro, Tomoo; Okimoto, Haruo; Nakao, Masami; and Iwaki, Masato, to Mazda Motor Corporation. Plural intake system for supercharged engine. 4,488,531, Cl. 123-559.000.
Taga, Yutaka; and Nakamura, Shinya, to Toyota Jidosha Kabushiki Kaisha. Electrical/hydraulic transmission control system varying line pressure according to engine load. 4,488,456, Cl. 74-866.000.
Tago, Yoshiaki: *See*—
Yamaguchi, Ryoji; and Tago, Yoshiaki, 4,489,410, Cl. 369-270.000.
Tai, Masaru: *See*—
Sadaki, Hiroshi; Narita, Hirokazu; Imaizumi, Hiroyuki; Konishi, Yoshinori; Inaba, Takihiro; Hirakawa, Tatsuo; Taki, Hideo; Tai, Masaru; Watanabe, Yasuo; and Saikawa, Isamu, 4,489,072, Cl. 424-246.000.
Taiho Pharmaceutical Company Limited: *See*—
Fujii, Setsuro; Hamakawa, Toshihiro; Ogawa, Kazuo; Muranaka, Yoshiyuki; and Hashimoto, Sadao, 4,489,091, Cl. 424-278.000.
Taikisha Ltd.: *See*—
Kajitsuka, Senri, 4,488,408, Cl. 62-113.000.
Takagi, Tsuneo, to Dainippon Screen Seizo Kabushiki Kaisha. Method and machine for automatic focusing in a projection system with continuously variable magnification. 4,488,804, Cl. 355-56.000.
Takahashi, Akira: *See*—
Ohta, Kenji; and Takahashi, Akira, 4,489,139, Cl. 428-621.000.
Takahashi, Ikuo, to Hitachi, Ltd. Fuel injection pump for internal combustion engine. 4,488,526, Cl. 123-357.000.
Takahashi, Kazuo; Sato, Hiroshi; and Kosugi, Masao, to Canon Kabushiki Kaisha. Shot arranging method in a divisional printing apparatus. 4,488,806, Cl. 355-77.000.
Takahashi, Kihei, to Yoshida Kogyo K. K. Sealing slide fastener stringer. 4,488,338, Cl. 24-389.000.
Takahashi, Tadashi: *See*—
Hatano, Yukihiko; and Takahashi, Tadashi, 4,489,372, Cl. 363-54.000.
Takamura, Takatsugu, to Colpo Company Limited. Menstruation periodic counter. 4,488,560, Cl. 128-738.000.
Takano, Hirotaka: *See*—
Ishiguru, Yukio; Takano, Hirotaka; and Funaki, Yuji, 4,489,082, Cl. 424-269.000.
Takao Kawamura: *See*—
Kawamura, Takao; and Yoshida, Masazumi, 4,489,149, Cl. 430-65.000.
Takayama, Minoru: *See*—
Uesaka, Susumu; Hagiwara, Toshio; Yusen, Akira; Takayama, Minoru; and Urakami, Shinichi, 4,488,817, Cl. 366-149.000.
Takebe, Katsuhiko, to Rhythm Watch Co., Ltd. Time signalling device for a timepiece which produces musical sounds. 4,488,820, Cl. 368-273.000.
Takeda Chemical Industries, Ltd.: *See*—
Terao, Shinji; and Maki, Yoshitaka, 4,489,096, Cl. 424-317.000.
Takeda, Shinji; and Hase, Nobutoshi, to Aisin Seiki Kabushiki Kaisha. Method for producing a longitudinal molding with nonuniform sections. 4,489,019, Cl. 264-26.000.
Taki, Hideo: *See*—
Sadaki, Hiroshi; Narita, Hirokazu; Imaizumi, Hiroyuki; Konishi, Yoshinori; Inaba, Takihiro; Hirakawa, Tatsuo; Taki, Hideo; Tai, Masaru; Watanabe, Yasuo; and Saikawa, Isamu, 4,489,072, Cl. 424-246.000.
Takiguchi, Michitaka: *See*—
Yoshimura, Motokazo; Takiguchi, Michitaka; Horie, Fujio; and Hirata, Koichi, 4,489,436, Cl. 381-51.000.
Tamura, Takashi, to Konishiriku Photo Industry Co., Ltd. Sheet feeding means. 4,488,718, Cl. 271-127.000.
Tanaka, Akeo. Apparatus and method for the combustion of water-in-oil emulsion fuels. 4,488,868, Cl. 431-243.000.
Tanaka, Honami: *See*—
Noguchi, Kosaku; Tanaka, Honami; Kumura, Yukimasa; Kitajima, Eiji; and Ishitobi, Toshifumi, 4,488,957, Cl. 208-40.000.
Tanaka, Takeshi: *See*—
Sekiguchi, Kiyonori; Tanaka, Takeshi; Kawagoe, Michio; and Yamada, Mitsumasa, 4,488,533, Cl. 123-569.000.
Tanaka, Yoshiaki: *See*—
Inami, Mamoru; Ohtsuki, Zenju; and Tanaka, Yoshiaki, 4,489,353, Cl. 360-25.000.

Tanaka, Yutaka; and Isobe, Toshinobu, to Sony Corporation. Separating filter. 4,489,346, Cl. 358-31.000.

Tandberg Data A/S: *See*—
Rudi, Guttorm, 4,489,355, Cl. 360-96.500.

Tandler, Peter: *See*—
Schopper, Bernd; Tandler, Peter; and Lowe, Derek, 4,488,742, Cl. 285-325.000.

Tang, David Y.; and Colson, James G., to Occidental Chemical Corporation. Purification of recycled paraffins in photochlorination process. 4,488,953, Cl. 204-163.00R.

Tanimoto, Akira: *See*—
Hashimoto, Shintaro; and Tanimoto, Akira, 4,489,396, Cl. 364-900.000.

Taniuchi, Kazuman, to Handa Giken Kogyo Kabushiki Kaisha. Ultrasonic air flowmeter for motor vehicles. 4,488,428, Cl. 73-118.200.

Tarpai, Gyula: *See*—
Farkas, Tibor; Horvath, Ibolya; Horvath, Laszlo I.; Vigh, Laszlo; Dombay, Zsolt; Nagy, Jozsef; Nagy nee Gera, Emilia; Pavlicsak, Csaba; and Tarpai, Gyula, 4,488,901, Cl. 71-121.000.

Tashiro, Norio: *See*—
Koinuma, Tokuju; Tashiro, Norio; and Yamamoto, Kaizo, 4,489,254, Cl. 315-39.510.

Taurus Gumiipari Vallalat: *See*—
Antal, Sandor; Smaroglay, Peter; and Lantos, Elemer, 4,489,021, Cl. 264-27.000.

Taylor, Harvey W., Jr., to Du Pont de Nemours, E. I., and Company. Process for preparing a surprint proof. 4,489,154, Cl. 430-253.000.

Taylor, Robert E.: *See*—
Miller, Gerald K.; Taylor, Robert E.; and Rautiola, Norman A., 4,488,521, Cl. 123-179.0BG.

Taylor-Winfield Corporation, The: *See*—
Haessly, Walter F., 4,489,229, Cl. 219-100.000.

Teach, Eugene G.; and Springer, Jeffery T., to Stauffer Chemical Company. Meta-anilide and meta-anilide urea and urea salt herbicidal compounds and methods of use. 4,489,010, Cl. 260-501.110.

Teasel, Thomas M.: *See*—
Teasel, William A.; Teasel, Thomas M.; and Colwell, Thomas R., 4,488,385, Cl. 52-92.000.

Teasel, William A.; Teasel, Thomas M.; and Colwell, Thomas R., to NFS Industries, Inc. Building construction. 4,488,385, Cl. 52-92.000.

Teche, Andre : *See*—
Martel, Jacques; Tessier, Jean; and Teche, Andre , 4,489,093, Cl. 424-304.000.

Technical Components Pty. Ltd.: *See*—
Potter, Mark A.; and Crawford, John S., 4,489,263, Cl. 318-727.000.

Technische Hogeschool Delft: *See*—
Schijve, Jacobus; Vogelesang, Laurens B.; and Marissen, Roelof, 4,489,123, Cl. 428-213.000.

Teepak, Inc.: *See*—
Bridgeford, Douglas J., 4,489,114, Cl. 428-36.000.

Tektronix, Inc.: *See*—
Diller, Calvin D., 4,489,270, Cl. 323-354.000.

Telectronics Pty. Ltd.: *See*—
Nappholz, Tibor A.; and Swift, Stephen J., 4,488,553, Cl. 128-419.0PG.
Nappholz, Tibor A.; and Swift, Stephen J., 4,488,554, Cl. 128-419.0PG.

TelTec Inc.: *See*—
Luetzow, Edwin J., 4,489,231, Cl. 219-137.00R.

Temple, Davis L., Jr., to Mead Johnson & Company. Diazaheterocyclopurines used as anti-broncho spasmatics and vasodilators. 4,489,078, Cl. 424-251.000.

Tendler, Robert K. Talking depth sounder. 4,489,405, Cl. 367-116.000.

Tentler, Michael, to Zenith Radio Corporation. Sine-wave decoding technique. 4,489,347, Cl. 358-118.000.

Terao, Shinji; and Maki, Yoshitaka, to Takeda Chemical Industries, Ltd. Quinone compounds, their production and use. 4,489,096, Cl. 424-317.000.

Tessier, Jean: *See*—
Martel, Jacques; Tessier, Jean; and Teche, Andre , 4,489,093, Cl. 424-304.000.

Texaco Development Corp.: *See*—
Cuscurida, Michael; and Gipson, Robert M., 4,488,982, Cl. 252-174.210.
Jahnke, Frederick C.; and Muenger, James R., 4,488,513, Cl. 122-32.000.

Texaco Inc.: *See*—
Brennan, Michael E.; and Speranza, George P., 4,489,178, Cl. 521-167.000.
Lewis, Paul H., 4,489,216, Cl. 585-739.000.

Texas Instruments Incorporated: *See*—
Southerland, Ebbin R., Jr., 4,489,400, Cl. 365-104.000.

Textiel Technick Haaksbergen B.V.: *See*—
Leuvelink, Gerrit W. E., 4,488,347, Cl. 29-433.000.

Textron Inc.: *See*—
Herud, Frank R., 4,488,838, Cl. 406-56.000.

Thiel, Klaus P.: *See*—
Bock, Gunther; Hafner, Bernhard; Muhl, Reinhold; and Thiel, Klaus P., 4,489,146, Cl. 430-5.000.

Thomas, Daniel L.; and Poetker, John J., to United States of America, Navy. Aimpoint processor for quantizing target data. 4,488,876, Cl. 434-20.000.

Thomas, Dennis R.: *See*—
Kress, Edward S.; Thomas, Dennis R.; and LaBerdia, William L., 4,488,848, Cl. 414-460.000.

Thomas, Rudolf: *See*—
Stetter, Jorg; Ditgens, Klaus; Thomas, Rudolf; Eue, Ludwig; and Schmidt, Robert R., 4,488,895, Cl. 71-90.000.

Thompson, Ronald J., to Federal Mogul Corporation. Offset wall bearing. 4,488,826, Cl. 384-288.000.

Thompson, William W. Flood shield assembly. 4,488,386, Cl. 52-169.100.

Thomson-CSF: *See*—
Beauvais, Yves, 4,489,251, Cl. 313-105.0CM.
Salvat, Francois; Bouko, Jean; and Coquio, Claude, 4,489,331, Cl. 343-753.000.

Thorpe, John D.: *See*—
Clemmow, Raymond J.; Radford, Leonard; and Thorpe, John D., 4,488,758, Cl. 299-81.000.

Tiger Vacuum Bottle Industrial Company, Limited: *See*—
Murakami, Morio, 4,488,660, Cl. 220-425.000.

Tischer, James C.: *See*—
Butterworth, Arthur L.; Tischer, James C.; and Utter, Robert E., 4,488,855, Cl. 417-368.000.

Tischer, Werner, to Zahnradfabrik Friedrichshafen, A.G. Hydraulic servo steering for vehicles. 4,488,401, Cl. 60-384.000.

Titherley, Robert H., to Hal Computers Limited. Computer peripheral testing equipment. 4,489,414, Cl. 371-20.000.

Toker, Nazmi Y., to Allegheny Ludlum Steel Corporation. Apparatus for strip casting having a heated orifice. 4,488,590, Cl. 164-423.000.

Tokuda, Kazuo: *See*—
Ikeda, Masaki; Amano, Tatsuyuki; and Tokuda, Kazuo, 4,489,344, Cl. 358-22.000.

Tokumaru, Yukuya: *See*—
Ikeda, Masashi; Tokumaru, Yukuya; Nakai, Masanori; and Ota, Masaki, 4,489,247, Cl. 307-477.000.

Tokyo Electric Co., Ltd.: *See*—
Matsushita, Tsuyoshi, 4,489,260, Cl. 318-696.000.

Tokyo Kinzoku Kabushikikaisha: *See*—
Sakai, Akira, 4,488,450, Cl. 74-531.000.

Tokyo Shibaura Denki Kabushiki: *See*—
Iida, Tetuo, 4,488,685, Cl. 242-4.0BE.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Ebata, Yasuo; Suzuki, Hitoshi; Matsumura, Sadao; and Fukuta, Katsuyoshi, 4,489,250, Cl. 310-313.00A.
Egawa, Hideharu; and Okumura, Katsuya, 4,488,674, Cl. 228-179.000.
Hatano, Yukihiko; and Takahashi, Tadashi, 4,489,372, Cl. 363-54.000.
Ikeda, Masashi; Tokumaru, Yukuya; Nakai, Masanori; and Ota, Masaki, 4,489,247, Cl. 307-477.000.
Kiguchi, Majime, 4,489,407, Cl. 369-77.200.
Koinuma, Tokuju; Tashiro, Norio; and Yamamoto, Kaizo, 4,489,254, Cl. 315-39.510.
Mitsutsuka, Norimasa, 4,488,964, Cl. 210-182.000.
Momose, Hiroshi, 4,488,351, Cl. 29-578.000.
Nagano, Katsumi, 4,489,244, Cl. 307-296.00R.
Nagumo, Masahide; and Kojima, Tadashi, 4,489,287, Cl. 331-1.00A.
Saitoh, Shinji; Miyamoto, Junichi; and Ichinose, Kazuaki, 4,489,402, Cl. 365-200.000.
Sato, Fumitaka, 4,489,395, Cl. 364-900.000.
Sawazaki, Norikazu, 4,489,278, Cl. 324-457.000.
Suzuki, Nobuo, 4,489,423, Cl. 377-58.000.
Tomita, Toyofumi, 4,488,438, Cl. 73-861.120.
Toyoda, Mitsuru; Haginomori, Eiichi; Ishimatsu, Masanori; and Okutomi, Tsutomu, 4,489,291, Cl. 338-200.000.
Uchida, Yukimasa, 4,489,339, Cl. 357-23.000.
Yamaguchi, Ryoji, 4,488,645, Cl. 206-444.000.
Yamaguchi, Ryoji; and Tago, Yoshiaki, 4,489,410, Cl. 369-270.000.
Yamauchi, Masahide; and Fukatsu, Kunio, 4,488,367, Cl. 40-531.000.

Tolman, Richard L.; Marburg, Stephen; and Callahan, Lynn T., III, to Merck & Co., Inc. Bacterial toxoids and gram-negative immune globulin therefrom. 4,488,991, Cl. 260-112.00R.

Tomita, Masao: *See*—
Kobayashi, Masaaki; Tomita, Masao; Matsumoto, Masayuki; Honjo, Masahiro; and Yamanishi, Kazuhiro, 4,489,352, Cl. 360-10.300.

Tomita, Toyofumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Square-wave current generator. 4,488,438, Cl. 73-861.120.

Toray Industries, Inc.: *See*—
Hatada, Kenji; Miyajima, Osamu; and Kobayashi, Hiroaki, 4,488,954, Cl. 204-169.000.
Ono, Masaki; Motegi, Masahiko; and Okabe, Kazuo, 4,489,117, Cl. 428-147.000.

Tornier, Alain, to Tornier S.A. France; and Butel, Jean. Device for osteosynthesis of fractures of the extremities of the femur. 4,488,543, Cl. 128-92.0BB.

Tornier S.A. France: *See*—
Tornier, Alain, 4,488,543, Cl. 128-92.0BB.

Tortorello, Anthony J., to DeSoto, Inc. Aqueous polyepoxide emulsions. 4,489,179, Cl. 523-420.000.

Toshiba Heating Appliances Co., Ltd.: *See*—
Kojima, Nobuyuki; and Sekigawa, Youichi, 4,488,536, Cl. 126-96.000.

Toyama Chemical Co., Ltd.: *See*—
Sadaki, Hiroshi; Narita, Hirokazu; Imaizumi, Hiroyuki; Konishi, Yoshinori; Inaba, Takihiro; Hirakawa, Tatsuo; Taki, Hideo; Tai, Masaru; Watanabe, Yasuo; and Saikawa, Isamu, 4,489,072, Cl. 424-246.000.

Toyo Kogyo Co., Ltd.: *See—*
Nobumoto, Kazutoshi; and Sumida, Shizuo, 4,488,625, Cl. 192-3.580.
Toyo Soda Manufacturing Co., Ltd.: *See—*
Ogura, Eiji; Mito, Kunihiro; and Arai, Shoji, 4,489,211, Cl. 568-842.000.
Toyoda, Mitsuru; Haginomori, Eiichi; Ishimatsu, Masanori; and Okutomi, Tsutomu, to Tokyo Shibaura Denki Kabushiki Kaisha. Circuit breaker provided with parallel resistor. 4,489,291, Cl. 338-200.000.
Toyota Jidosha Kabushiki Kaisha: *See—*
Miura, Hirohisa; Satou, Hiroshi; and Natsume, Toshio, 4,488,904, Cl. 75-62.000.
Sekiguchi, Kiyonori; Tanaka, Takeshi; Kawagoe, Michio; and Yamada, Mitsumasa, 4,488,533, Cl. 123-569.000.
Sugiura, Kengo; Yamauchi, Yasutaka; and Ito, Hiroshi, 4,488,524, Cl. 123-339.000.
Taga, Yutaka; and Nakamura, Shinya, 4,488,456, Cl. 74-866.000.
Toyota Jidoshakogyo Kabushikikaisha: *See—*
Arakawa, Susumu; Tsukigahora, Tooru; and Shirai, Akira, 4,488,404, Cl. 60-535.000.
Tracy, Richard J. Lash device. 4,488,333, Cl. 24-140.000.
Trane Company, The: *See—*
Butterworth, Arthur L.; Tischer, James C.; and Utter, Robert E., 4,488,855, Cl. 417-368.000.
Tremblay, Richard P.: *See—*
Conley, Richard W.; and Tremblay, Richard P., 4,488,741, Cl. 285-250.000.
Trenkle, Robert W.: *See—*
Hill, Ira D.; Trenkle, Robert W.; Mookherjee, Braja D.; and Wolff, Robin K., 4,488,973, Cl. 252-8.600.
Trexler, Frederick D.: *See—*
Edling, Ellsworth A.; McKenna, Richard P.; Trexler, Frederick D.; and Peterick, E. Thomas, Jr., 4,489,269, Cl. 322-2.00R.
Tri-Plas Inc.: *See—*
Halliday, Douglas S., 4,488,676, Cl. 229-43.000.
Triunfol, David. Body restraint for invalid patients and the like. 4,488,544, Cl. 128-134.000.
Trojan, Vaclav: *See—*
Jirovsky, Ivan; Jojko, Zorjan; Kokoska, Ivan; Prusek, Jaroslav; and Trojan, Vaclav, 4,488,938, Cl. 204-1.00T.
Trostyanetsky, David, to AT&T Technologies, Inc. Time slot-controlling circuit for keyboard switch module, and apparatus incorporating same. 4,489,310, Cl. 340-365.0VL.
Trubitsin, Alexandr V.; Polyakov, Mikhail G.; Fomin, Georgy M.; Denisov, Petr I.; Petrov, Pavel E.; and Pomelnikov, Petr P., to Vsesojuzny Nauchno-Issledovatelsky Institut Metiznoi Promyshlennosti Vniimetiz. Coiling apparatus for long-size products. 4,488,688, Cl. 242-78.000.
TRW Inc.: *See—*
Kawahara, Steven K.; and Peterson, James G., 4,489,393, Cl. 364-728.000.
Rau, Jim L., 4,488,569, Cl. 137-101.000.
Tseung, Alfred C. C.; Chan, Ho C.; Fouzder, Nani B.; and Sriskandarajah, Thurairajah, to National Research Development Corporation. Prevention of hydrogen embrittlement of metals in corrosive environments. 4,488,578, Cl. 138-146.000.
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Sainen, Tsutomu; and Fujita, Yoshitaka, 4,488,580, Cl. 139-336.000.
Tsukada, Hirokazu: *See—*
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Tsukigahora, Tooru: *See—*
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Tsunekawa, Tokuichi: *See—*
Iura, Yukio; Shimizu, Masami; Aizawa, Hiroshi; Tsunekawa, Tokuichi; Uchidoi, Masanori; and Yamamichi, Masayoshi, 4,488,800, Cl. 354-445.000.
Tsutsumi, Kazumichi; and Ueda, Tadakazu, to Mitsubishi Denki Kabushiki Kaisha; and Mazda Motor Corporation. Engine speed control device for internal combustion engine. 4,488,525, Cl. 123-352.000.
Tsuyama Mfg. Co.: *See—*
Kagayama, Joe, 4,488,774, Cl. 350-99.000.
Turetsky, Isadore. Controlling and switching mechanism. 4,488,530, Cl. 123-477.000.
Turner Bellows, Inc.: *See—*
Pontarella, Armand, 4,488,463, Cl. 83-13.000.
Twardowska, Helena, to ERCO Industries Limited. Stabilization of red phosphorus. 4,489,183, Cl. 523-440.000.
Tyree, William H.: *See—*
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Tyson, Richard L.: *See—*
Wagner, Daniel B.; and Tyson, Richard L., 4,489,165, Cl. 436-500.000.
Uberwolf, Heinz: *See—*
Halberschmidt, Friedrich; Audi, Josef; Radermacher, Herbert; and Uberwolf, Heinz, 4,488,846, Cl. 414-152.000.
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Uchidoi, Masanori: *See—*
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Ueno, Keiji, to Sumitomo Electric Industries, Ltd. Fluororubber-based heat-shrinkable tubes and composition therefor. 4,489,113, Cl. 428-36.000.
Uenobe, Fukuji; Matsuura, Shin; Yamamoto, Nobuhiro; and Shioyama, Masakazu, to Yushiro Chemical Industry Co., Ltd. Lipid reducing agents. 4,489,067, Cl. 424-195.000.
Uesaka, Susumu; Hagiwara, Toshio; Yusen, Akira; Takayama, Minoru; and Urakami, Shinichi, to Nippon Light Metal Co., Ltd. Device for making frozen confections. 4,488,817, Cl. 366-149.000.
Ueyama, Masayuki: *See—*
Iida, Takashi; Ueyama, Masayuki; and Ishimura, Toshihiko, 4,488,798, Cl. 354-402.000.
Ukita, Eiji: *See—*
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ULSI Technology Research Association: *See—*
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Umezawa, Yujiro; Suzuki, Yoshio; Miura, Teruo; and Kawasaki, Kiyohito, to Bridgestone Tire Company Limited. Pneumatic radial tires. 4,488,587, Cl. 152-359.000.
Union Carbide Corporation: *See—*
Chu, Nan S., 4,489,205, Cl. 549-417.000.
Clark, Milton B., 4,489,144, Cl. 429-196.000.
Delano, Mark A., 4,488,407, Cl. 62-74.000.
Hodakowski, Leonard E., 4,489,012, Cl. 260-946.000.
Keogh, Michael J.; Wallace, Scott L.; and Brown, Geoffrey D., 4,489,029, Cl. 264-174.000.
Kobayashi, Hisashi; and Snyder, William J., 4,488,682, Cl. 239-132.300.
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Porter, Michael J.; and Galer, Richard E., 4,488,917, Cl. 156-39.000.
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Agriculture: *See—*
Andrews, Bethlehem K.; and Reinhardt, Robert M., 4,488,878, Cl. 8-187.000.
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Air Force: *See—*
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Slobodnik, Andrew J.; and Colvin, Roger D., 4,489,289, Cl. 331-107.00A.
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Betts, Robert E., 4,488,490, Cl. 102-513.000.
Looger, Lonnie L.; and Smith, Gerald S., 4,488,488, Cl. 102-387.000.
Rhodes, Richard R., 4,488,491, Cl. 102-522.000.
Rozniecki, Edward J., 4,489,366, Cl. 362-270.000.
Young, Harvey R., 4,488,851, Cl. 416-33.000.
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Gilbert, Marian; and Kaun, Thomas D., 4,489,143, Cl. 429-103.000.
Hopper, Albert C., Jr., 4,488,673, Cl. 228-122.000.
Skotheim, Terje, 4,488,943, Cl. 204-58.500.
Suenaga, Masaki; Klamut, Carl J.; and Luhman, Thomas S., 4,489,219, Cl. 174-128.00S.
Yu, Jiunn S., 4,489,276, Cl. 324-338.000.
Interior: *See—*
Gomes, John M.; Raddatz, Andrea E.; and Baglin, Elizabeth G., 4,489,044, Cl. 423-53.000.
National Aeronautics and Space Administration: *See—*
Dabney, Richard W., 4,489,264, Cl. 318-729.000.
Fox, Robert L.; Frizzill, Alan W.; Little, Bruce D.; Progar, Donald J.; Coultrip, Robert H.; Couch, Richard H.; Gleason, John R.; Stein, Bland A.; Buckley, John D.; and St. Clair, Terry L., 4,488,335, Cl. 24-304.000.
Grant, William B.; and Hinkley, E. David, Jr., 4,489,239, Cl. 250-339.000.
Hooper, Sonne L.; and Setzer, Drei, 4,488,663, Cl. 222-43.000.
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Berlincourt, Ted G., 4,489,274, Cl. 324-248.000.
Erbe, Alfred R., 4,488,765, Cl. 339-42.000.

Forester, Donald W.; Lubitz, Peter; and Vittoria, Carmine, 4,489,049, Cl. 423-644.000.
Ginsberg, Howard S., 4,489,369, Cl. 363-21.000.
Lewis, Bernard L.; and Kretschmer, Frank F., 4,489,320, Cl. 343-7.700.
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U.S. Philips Corporation: *See*—
Baker, Geoffrey, 4,489,238, Cl. 250-338.000.
Lucassen, Wilhelmus H. P., 4,488,539, Cl. 126-433.000.
Schwieker, Horst H., 4,489,428, Cl. 378-176.000.
van Essen, Roelof M.; and Buschow, Kurt H. J., 4,489,050, Cl. 423-644.000.
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Verhoeven, Johannes M. G.; and Amendt, Herman M. A., 4,489,408, Cl. 369-112.000.
Voncken, Wilhelmus G., 4,489,338, Cl. 357-23.000.

United States Surgical Corporation: *See*—
Shichman, Daniel, 4,488,523, Cl. 128-334.00R.

United Technologies Corporation: *See*—
Wagner, Robert A., 4,488,773, Cl. 350-96.200.

University of Exeter: *See*—
Lee, Alan J. C.; and Ling, Robin S. M., 4,488,549, Cl. 128-303.00R.

University of Utah: *See*—
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Upeslacis, Janis: *See*—
Shepherd, Robert G.; and Upeslacis, Janis, 4,489,094, Cl. 424-310.000.

Upjohn Company, The: *See*—
Lomen, Pavel L., 4,489,080, Cl. 424-260.000.
Yalkowsky, Samuel H., 4,489,026, Cl. 264-123.000.

Urakami, Shinichi: *See*—
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Urban Transportation Development Corporation Ltd.: *See*—
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Urfer, Allen D.; VanderBurgh, Leonard F.; and McDaniel, Robert S., Jr., to A. E. Staley Manufacturing Company. Lower alkyl glycosides to reduce viscosity in aqueous liquid detergents. 4,488,981, Cl. 252-174.170.

UTB Umweltechnik Buchs AG: *See*—
Goerlich, Lothar, 4,488,960, Cl. 210-97.000.

Utter, Robert E.: *See*—
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Valcor Scientific Ltd.: *See*—
Walton, Alan G.; Sparer, Randall V.; and Ekwuribe, Nnochiro, 4,489,065, Cl. 424-180.000.

Valdes, Oswaldo J. Synthetic plastic pipe coupling and method of assembly. 4,488,738, Cl. 285-40.000.

Vale, Wylie W., Jr.: *See*—
Rivier, Catherine L.; Rivier, Jean E. F.; and Vale, Wylie W., Jr., 4,489,061, Cl. 424-177.000.
Rivier, Jean E. F.; Spiess, Joachim; and Vale, Wylie W., Jr., 4,489,163, Cl. 436-86.000.

Valeo: *See*—
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Valko, Joseph T., to PPG Industries, Inc. Resinous compositions curable through a transesterification curing mechanism. 4,489,182, Cl. 523-414.000.

VanderBurgh, Leonard F.: *See*—
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van der Linde, Berend J.: *See*—
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van Essen, Roelof M.; and Buschow, Kurt H. J., to U.S. Philips Corporation. Method of preparing a hydrogen-absorbing alloy. 4,489,050, Cl. 423-644.000.

Van Huis, Philip J.: *See*—
Moore, James I.; and Van Huis, Philip J., 4,488,589, Cl. 164-155.000.

Van Note, Todd. Marksmanship training apparatus. 4,488,369, Cl. 42-1.00A.

Van Ooijen, Johannes A. C.; and Verhaar, Robertus D. J., to U.S. Philips Corporation. Magnetic sensor having multilayered flux conductors. 4,489,357, Cl. 360-113.000.

Van Wert, Bernard: *See*—
Gutek, Beth I.; and Van Wert, Bernard, 4,489,127, Cl. 428-266.000.

Varma, Ravi K., to E. R. Squibb & Sons, Inc. Androstene-17β-alkylthiomethyl ethers. 4,488,995, Cl. 260-397.450.

Varner, Kevin. Lightweight heliostat system. 4,488,779, Cl. 350-632.000.

VDO Adolf Schindling AG: *See*—
Caramel, Rudolf, 4,488,786, Cl. 350-337.000.
Pfalzgraf, Manfred; and Probst, Kurt, 4,488,527, Cl. 123-399.000.

Veb Kombinat Fortschritt Landmaschinen Neustadt in Sachsen: *See*—
Lehmann, Heinz; Rossnik, Heinz; and Blumenthal, Reinhard, 4,488,732, Cl. 280-781.000.

Velazquez, Angel M.; Vivas, Eduardo N.; and Rios, Joe, to Commonwealth of Puerto Rico. Apparatus for assembling circuit components with a printed circuit board. 4,488,352, Cl. 29-741.000.

Venot, Jean, to ASA S.A. Device for stretching, condensing and transporting a rove of fibers during a spinning operation. 4,488,397, Cl. 57-328.000.

Verhaar, Robertus D. J.: *See*—
Van Ooijen, Johannes A. C.; and Verhaar, Robertus D. J., 4,489,357, Cl. 360-113.000.

Verboeven, Johannes M. G.; and Amendt, Herman M. A., to U.S. Philips Corporation. Beam-splitting prism, method of manufacturing said prism, and optical read and/or write unit provided with said prism. 4,489,408, Cl. 369-112.000.

Vermalle, Jean-Claude: *See*—
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Vezain, Gerard; and Vermalle, Jean-Claude, to Societe Nationale Industrielle et Aerospatiale. Sensor release latch for space vehicle. 4,489,329, Cl. 343-705.000.

Vick, Howard A.: *See*—
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Victor Company of Japan, Ltd.: *See*—
Inami, Mamoru; Ohtsuki, Zenju; and Tanaka, Yoshiaki, 4,489,353, Cl. 360-25.000.
Saito, Takashi; Miki, Tatsuya; and Kumaki, Takashi, 4,489,409, Cl. 369-126.000.
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; and Yoshihara, Kenji, 4,489,398, Cl. 369-32.000.

Victory Enterprises Technology, Inc.: *See*—
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Vigh, Laszlo: *See*—
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Vineski, John E., to Xerox Corporation. Release agent management system for a heat and pressure fuser apparatus. 4,488,504, Cl. 118-60.000.

Vista, Sally L.: *See*—
Nicholson, Richard R.; Vista, Sally L.; and Berkey, Reynold A., 4,488,910, Cl. 106-90.000.

Vittoria, Carmine: *See*—
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Vivas, Eduardo N.: *See*—
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Voelz, Richard F., to Renner Manufacturing Company. Spreader assembly. 4,488,749, Cl. 294-815.00F.

Vogelesang, Laurens B.: *See*—
Schijve, Jacobus; Vogelesang, Laurens B.; and Marissen, Roelof, 4,489,123, Cl. 428-213.000.

Vogt, Robert K.; and Heit, Martin A., to E. W. Buschman Company. Roller conveyor with friction roll device. 4,488,639, Cl. 198-787.000.

Volimer Werke Maschinenfabrik GmbH: *See*—
Beck, Ernst; and Lenard, Peter, 4,488,458, Cl. 76-77.000.

von Au, Gunter; Innertsberger, Ernst; Schmidlkofer, Jakob; and Kaiser, Wolfgang. Fluoroalkyloxylakyl containing organopolysiloxanes. 4,489,201, Cl. 528-42.000.

Voncken, Wilhelmus G., to U.S. Philips Corporation. Memory cell with thick oxide at least as deep as channel stop. 4,489,338, Cl. 357-23.000.

von Gnechten, Lawrence A.; Byrnes, Thomas E.; and Lasky, John C., to Consolidated Papers, Inc. One piece interlocking outfold container. 4,488,675, Cl. 229-33.000.

von Recum, Andreas F., to Clemson University. Method of two-stage implantation of a joint prosthesis and prosthetic product. 4,488,319, Cl. 3-1.913.

von Roda, Eckart: *See*—
Dausinger, Friedrich; Muller, Werner; von Roda, Eckart; Reibetanz, Wilbert; and Baumann, Otto, 4,488,882, Cl. 51-295.000.

Voorhees, Edward J.: *See*—
Hooper, Mark W.; and Voorhees, Edward J., 4,488,834, Cl. 405-58.000.

Voorheis, Temple S., to Coen Company, Inc. High efficiency, low NOX emitting, staged combustion burner. 4,488,869, Cl. 431-352.000.

Vora, Madhukar B.; and Herndon, William H., to Fairchild Camera & Instrument Corp. Method of making an integrated circuit bipolar memory cell. 4,488,350, Cl. 29-577.00C.

Vorbruggen, Helmut; Schwarz, Norbert; Loge, Olaf; and Elger, Walter, to Schering Aktiengesellschaft. Prostanoic acid derivatives and their preparation. 4,489,092, Cl. 424-304.000.

Vota, Mario F. Apparatus for the generation and the automatic control of ultrasonic waves in the treatment of fluids. 4,488,816, Cl. 366-116.000.

Vsesojuzny Nauchno-Issledovatelsky Institut Metiznoi Promyshlennosti Vniimetiz: *See*—
Trubitsin, Alexandr V.; Polyakov, Mikhail G.; Fomin, Georgy M.; Denisov, Petr I.; Petrov, Pavel E.; and Pomelnikov, Petr P., 4,488,688, Cl. 242-78.000.

W. P. Hickman Co.: *See*—
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Wada, Shigetaka; and Yamada, Toshio, to NGK Insulators, Ltd. Apparatus for heating a mixed gas on an internal combustion engine. 4,489,232, Cl. 219-206.000.

Wagner, Daniel B.; and Tyson, Richard L., to Becton Dickinson and Company. Chromogenic tracers for use in an assay. 4,489,165, Cl. 436-500.000.

Wagner, Otto W. Eyeglasses with quick connect and disconnect temple pieces. 4,488,792, Cl. 351-153.000.

Wagner, Robert A., to United Technologies Corporation. Optical fiber position sensor. 4,488,773, Cl. 350-96.200.
Waite, Lynn E., to General Motors Corporation. Wire and pin connector arrangement. 4,488,831, Cl. 403-209.000.
Wakabayashi, Takao, to Nakanishi Metal Works Co., Ltd. Power-and-free conveyor. 4,488,493, Cl. 104-172.00S.
Walker, Herbert B.; and Hoppough, Richard S., to Micro Computer Systems, Inc. Telephone line/subscriber equipment disconnect apparatus. 4,489,221, Cl. 179-19.000.
Walker, Keith A. M., to Syntex (U.S.A.) Inc. Spermicidal thioketal substituted N-alkyl imidazoles. 4,489,087, Cl. 424-273.00R.
Wall, Stanford J. Screwdriver with dual tip. 4,488,462, Cl. 81-439.000.
Wallace, Scott L.: *See*—
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Walsh, J. William: *See*—
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Walton, Alan G.; Sparer, Randall V.; and Ekwuribe, Nnochiro, to Valcor Scientific Ltd. Chondroitin drug Complexes. 4,489,065, Cl. 424-180.000.
Wang, An. Data communication system. 4,489,419, Cl. 375-36.000.
Wang, Patricia C.; and Dawson, Daniel J., to Dynapol. Polymeric active methylene compounds. 4,489,197, Cl. 525-328.200.
Wang, Samuel S. M., to Merrell Dow Pharmaceuticals Inc. Hypoglycemic N-(2-substituted-3-dialkylamino-2-propenylidene)-N-alkylalkanaminium camsylate salts. 4,489,011, Cl. 260-501.190.
Wank, Larry A.; and Braitling, Joseph G., to North American Philips Corporation. Composition of matter for use in manufacturing non-magnetic parts of a magnetic head and method of manufacturing the composition. 4,489,168, Cl. 501-134.000.
Wanninger, Paul; and Kleinschmidt, Ernst, to Messerschmitt-Bolkow-Blohm GmbH. Cast explosive charge composition. 4,488,916, Cl. 149-2.000.
Ward, Edward L. Pest vacuum device. 4,488,331, Cl. 15-339.000.
Ward, Richard A.: *See*—
Klein, Elias; Wathen, Ronald L.; Ward, Richard A.; Cosentino, Louis C.; Fuller, Larry E.; and Martinez, Felix J., 4,488,877, Cl. 604-175.000.
Warner-Lambert Company: *See*—
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Warner, Richard C., to Singer Company, The. Circuitry for controlling the reflected torque on a generator driven by a fluid meter. 4,489,290, Cl. 322-35.000.
Watanabe, Masato; and Oda, Kazuhiro, to Konishiroku Photo Industry Co. Ltd. Ink jet printing apparatus. 4,489,335, Cl. 346-140.00R.
Watanabe, Seizo. Process for forming thin film, heat treatment process of thin film sheet, and heat treatment apparatus therefor. 4,489,124, Cl. 428-220.000.
Watanabe, Shojiro; and Matsukawa, Hiroharu, to Fuji Photo Film Co., Ltd. Heat-sensitive recording paper. 4,489,337, Cl. 346-209.000.
Watanabe, Yasuo: *See*—
Sadaki, Hiroshi; Narita, Hirokazu; Imaizumi, Hiroyuki; Konishi, Yoshinori; Inaba, Takihiro; Hirakawa, Tatsuo; Taki, Hideo; Tai, Masaru; Watanabe, Yasuo; and Saikawa, Isamu, 4,489,072, Cl. 424-246.000.
Waters, John E. Truck tool box. 4,488,669, Cl. 224-273.000.
Wathen, Ronald L.: *See*—
Klein, Elias; Wathen, Ronald L.; Ward, Richard A.; Cosentino, Louis C.; Fuller, Larry E.; and Martinez, Felix J., 4,488,877, Cl. 604-175.000.
Watson, Charles J., to Bell & Howell Company. Light valve/fader and control circuit. 4,488,807, Cl. 355-83.000.
Watson, Christopher A., to International Telephone & Telegraph Corporation. Micropower circuit. 4,488,440, Cl. 73-861.770.
Watson, James M.: *See*—
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Watts, Larry D.: *See*—
Mark, Kelly J., 4,488,649, Cl. 211-49.00S.
Wavin B.V.: *See*—
de Lange, Tinus, 4,488,739, Cl. 285-55.000.
Wean United, Inc.: *See*—
Greenberger, Joseph I., 4,488,710, Cl. 266-114.000.
Weaver, Douglas E.; and Brown, Ralph W., II, to White Consolidated Industries, Inc. Adjustable air duct for a meat keeper. 4,488,412, Cl. 62-382.000.
Webb, Paul C.: *See*—
Galer, Richard E.; and Webb, Paul C., 4,488,909, Cl. 106-89.000.
Webb, Watt W.: *See*—
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Weidmann, Ulrich; and Weber, Hans R. Testing device for tennis racquets. 4,488,444, Cl. 73-862.450.
Weiler Brush Company, Inc.: *See*—
Weiler, Karl M., 4,488,760, Cl. 300-21.000.
Weiler, Karl M., to Weiler Brush Company, Inc. Method of manufacturing a bushing tool. 4,488,760, Cl. 300-21.000.
Weinstein, Barry M., to Colgate-Palmolive Company. Bentonite agglomerates. 4,488,972, Cl. 252-8.600.
Weiss, Leonard: *See*—
Lanier, Charles S.; Maxwell, Hiram M.; McKay, Roger E.; and Weiss, Leonard, 4,489,379, Cl. 364-200.000.
Welch, Derek S.: *See*—
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Wells, Alton R.: *See*—
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Wells, Robert M.; and Wells, Alton R. Welding method and thermostat produced. 4,489,228, Cl. 219-56.220.
Welters, Reiner; Gehlhaus, Juergen; and Moeschl, Gernot, to Merck Patent Gesellschaft mit beschraenkter Haftung. U.V. Absorbing cosmetic compositions. 4,489,057, Cl. 424-47.000.
Wenckus, Joseph F., to Ceres Electronics Corporation. Method and means of rapidly distinguishing a simulated diamond from natural diamond. 4,488,821, Cl. 374-44.000.
Wengrovius, Jeffrey H., to General Electric Company. Room temperature vulcanizable organopolysiloxane compositions. 4,489,199, Cl. 528-16.000.
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Konersmann, Erhard, 4,488,381, Cl. 51-98.00R.
Wermeister, Gunter; and Noy, Josef, to Santrade Ltd. Internal disk milling cutter. 4,488,839, Cl. 407-43.000.
Werner, Clarence L. Anti-theft devices for parked tractor vehicles. 4,488,417, Cl. 70-253.000.
Wernimont, Theodore A., to J. I. Case Company. Coupler assembly. 4,488,850, Cl. 414-723.000.
Wessel Company, Inc., The: *See*—
Jacobs, Anthony S.; Riley, James E.; and Christman, Jon D., 4,488,737, Cl. 281-31.000.
West, William T., to Pennwalt Corporation. Method of reducing damage to foodstuffs using cushioning aqueous foams. 4,488,634, Cl. 198-493.000.
Western Publishing Company, Inc.: *See*—
Bockholt, Karlheinz H.; and Harris, John F., III, 4,488,679, Cl. 235-469.000.
Westinghouse Electric Corp.: *See*—
Altenhof, James N., Jr.; McKee, Jere L.; and Beatty, William E., Jr., 4,489,295, Cl. 335-20.000.
Courson, Iber C., 4,488,631, Cl. 198-335.000.
Fu, John W., 4,488,939, Cl. 204-1.00T.
Hall, Gary M., 4,489,298, Cl. 336-70.000.
Kernick, Andress, 4,489,371, Cl. 363-41.000.
Kuznetsov, Stephen B., 4,489,265, Cl. 318-773.000.
Putman, Richard E., 4,489,375, Cl. 364-157.000.
Putman, Richard E., 4,489,376, Cl. 364-165.000.
Wien, Raymond E.; Hanks, Jack G.; and Cotton, John F., 4,489,299, Cl. 337-70.000.
Yannopoulos, Lympexios N., 4,488,990, Cl. 252-629.000.
Wheatley, Barry I.: *See*—
Pooley, Frederick D.; Jones, Huw O.; and Wheatley, Barry I., 4,488,950, Cl. 204-116.000.
Whirlpool Corporation: *See*—
Baker, Daniel A., 4,488,823, Cl. 374-170.000.
Jackson, William A.; and Kretchman, Gerald L., 4,488,363, Cl. 34-55.000.
White Consolidated Industries, Inc.: *See*—
Weaver, Douglas E.; and Brown, Ralph W., II, 4,488,412, Cl. 62-382.000.
White, James N. J.; Ruxton, David S.; and Stewart, Alec D., to Rodime Limited. Method and apparatus for controlling a stepper motor. 4,489,259, Cl. 318-696.000.
Whitehouse, Hugh L., to Stanley Works, The. Torque control clutch for a power tool. 4,488,604, Cl. 173-12.000.
Wicker, Gordon R., to AMAX Inc. Dual control actuator for valves. 4,488,704, Cl. 251-265.000.
Wico Corporation: *See*—
Peters, Albin, 4,488,724, Cl. 273-129.00S.
Widegren, Lars, to Elektro Diesel. Method and device for cleaning stumps. 4,488,586, Cl. 144-363.000.
Wien, Raymond E.; Hanks, Jack G.; and Cotton, John F., to Westinghouse Electric Corp. Secondary circuit breaker for distribution transformer. 4,489,299, Cl. 337-70.000.
Wilbur, David L.: *See*—
Pulliam, Daniel L.; Evans, John A.; Wilbur, David L.; and Fox, Robert D., 4,489,140, Cl. 428-654.000.
Wild Heerbrugg Aktiengesellschaft: *See*—
Pech, Helmut, 4,489,107, Cl. 427-162.000.
Wilkinson, Robert E.: *See*—
Epel, Joseph N.; and Wilkinson, Robert E., 4,488,862, Cl. 425-405.00R.
Wilkinson, Samuel: *See*—
Lowe, Lawrence A.; Smith, Terence W.; and Wilkinson, Samuel, 4,489,062, Cl. 424-177.000.
William H. Rorer, Inc.: *See*—
Douglas, George H.; and Diamond, Julius, 4,488,993, Cl. 260-239.00A.
Williams International Corporation: *See*—
Danis, Louis J., 4,488,920, Cl. 156-155.000.
Williams, Joy L.; Rose, David L.; and Haas, Louis M., to Cargill, Incorporated. Method of preparing highly purified kiln dried solar salt. 4,488,958, Cl. 209-2.000.

Williams, Oliver L.: *See*—
Mosley, Earnest D.; and Williams, Oliver L., 4,488,707, Cl. 254-243.000.
Williamson, Lawrie A.: *See*—
Joseph, Stephen H.; Miller, John E.; and Williamson, Lawrie A., 4,488,860, Cl. 425-131.100.
Willimczik, Bernd: *See*—
Anderka, Gerold; Brandt, Joachim; DeBlitz, Gerhard; Martens, Rolf; Paschen, Rolf; Post, Jurgen; and Willimczik, Bernd, 4,489,333, Cl. 346-139.00R.
Wilson, Bill. Herbicide applicator apparatus. 4,488,376, Cl. 47-1.500.
Wilson, David A.; and Crump, Druce K., to Dow Chemical Company, The. Polyumeric alkylene phosphoric acid piperazine derivatives as scale inhibitors. 4,489,203, Cl. 544-337.000.
Wilson, David N.: *See*—
Atteck, Louis; and Wilson, David N., 4,488,332, Cl. 17-46.000.
Wilson, Michael T., to Medical Center Prosthetics, Inc. Prosthetic hip. 4,488,320, Cl. 3-15.000.
Winnek, Douglas F. Camera for three-dimensional portraiture. 4,488,795, Cl. 354-115.000.
Wise, Daniel J.; and Woodhall, Donna M., to Ex-Cell-O Corporation. Laminated paperboard container with absorption resistance means, and blank for constructing same. 4,489,112, Cl. 428-35.000.
Wisebaker, Robert E., to National Machinery Company, The. Forging machine for producing rivets or the like having running adjustments. 4,488,426, Cl. 72-450.000.
Wismann, Horst. Process for the production of dental replacement parts made of metal. 4,488,940, Cl. 204-4.000.
Withers, Howard P., to Atlantic Richfield Company. Methane conversion. 4,489,215, Cl. 585-500.000.
Wittemann, Robert F.: *See*—
Flaska, Joseph M.; and Wittemann, Robert F., 4,488,668, Cl. 222-548.000.
Woelfel, James A. Molding composition. 4,489,184, Cl. 523-466.000.
Wohlfarth, Peter, to Daimler-Benz Aktiengesellschaft. Engine cooling device. 4,488,518, Cl. 123-41.490.
Wolf, Theodore L.; Rossman, John A.; Quinn, Russell C.; and Kish, Thomas J., to Jos. Dyson and Sons, Inc. Method of making forks for fork lift tracks. 4,488,422, Cl. 72-377.000.
Wolff, Robin K.: *See*—
Hill, Ira D.; Trenkle, Robert W.; Mookherjee, Braja D.; and Wolff, Robin K., 4,488,973, Cl. 252-8.600.
Wong, Franklin S.; and Hildebrand, Clair E., to Allied Corporation. Non plugging falling film plasma reactor. 4,489,041, Cl. 422-186.220.
Wood, Bernard J.: *See*—
Sancier, Kenneth M.; and Wood, Bernard J., 4,489,275, Cl. 324-315.000.
Wood, Lawrence M.: *See*—
Godshalk, Russell L.; Bray, Richard L.; and Wood, Lawrence M., 4,488,670, Cl. 226-10.000.
Woodhall, Donna M.: *See*—
Wise, Daniel J.; and Woodhall, Donna M., 4,489,112, Cl. 428-35.000.
Woodrum, Dorothy B. Beaded trimmed satin christmas ornament. 4,489,111, Cl. 428-11.000.
Woratyla, John A.: *See*—
Stumpf, Harry M.; and Woratyla, John A., 4,488,581, Cl. 140-147.000.
Worst, Marc T. Stored power system for vehicle accessories. 4,489,242, Cl. 307-10.00R.
Wright, Richard F.: *See*—
Sanders, Frederick W.; Hillesbrand, Gary F.; Arney, Jonathan S.; and Wright, Richard F., 4,489,151, Cl. 430-138.000.
Wright, William B., Jr.; and Press, Jeffrey B., to American Cyanamid Company. Substituted N-[ω-(1H-imidazol-1-yl)alkyl]-amides. 4,489,089, Cl. 424-273.00R.
Wutzler, Host: *See*—
Auer, Peter; Kluge, Fritz; Lieske, Helmut; and Wutzler, Host, 4,489,024, Cl. 264-71.000.
Wyar, Paul F.: *See*—
Richmond, Robert L.; Corrigan, John E.; and Wyar, Paul F., 4,489,413, Cl. 370-30.000.
Wynalda Litho Inc.: *See*—
Wynalda, Robert M., 4,488,644, Cl. 206-387.000.
Wynalda, Robert M., to Wynalda Litho Inc. Packaging system for video cassettes. 4,488,644, Cl. 206-387.000.
Xerox Corporation: *See*—
Allison, Kenneth L.; Gomez, Helio; and Manchego, Robert, 4,489,427, Cl. 378-170.000.
Horgan, Anthony M., 4,489,148, Cl. 430-59.000.
Vineski, John E., 4,488,504, Cl. 118-60.000.
Yalkowsky, Samuel H., to Upjohn Company, The. Process for preparing solid unit dosage forms of ultra-low dose drugs. 4,489,026, Cl. 264-123.000.
Yamada, Mitsumasa: *See*—
Sekiguchi, Kiyonori; Tanaka, Takeshi; Kawagoe, Michio; and Yamada, Mitsumasa, 4,488,533, Cl. 123-569.000.
Yamada, Toshio: *See*—
Wada, Shigetaka; and Yamada, Toshio, 4,489,232, Cl. 219-206.000.
Yamaguchi, Hisami: *See*—
Fukuoka, Hisatomi; and Yamaguchi, Hisami, 4,488,656, Cl. 215-307.000.
Yamaguchi, Ryoji, to Tokyo Shibaura Denki Kabushiki Kaisha. Case for housing information memory media therein. 4,488,645, Cl. 206-444.000.
Yamaguchi, Ryoji; and Tago, Yoshiaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for installing a disk. 4,489,410, Cl. 369-270.000.
Yamaha Hatsudoki Kabushiki Kaishi: *See*—
Kishida, Hajime, 4,488,519, Cl. 123-52.00M.
Yamaki, David A.: *See*—
St. Clair, Terry L.; and Yamaki, David A., 4,489,027, Cl. 264-137.000.
Yamamichi, Masayoshi: *See*—
Iura, Yukio; Shimizu, Masami; Aizawa, Hiroshi; Tsunekawa, Tokuichi; Uchidoi, Masanori; and Yamamichi, Masayoshi, 4,488,800, Cl. 354-445.000.
Yamamoto, Kaizo: *See*—
Koinuma, Tokuju; Tashiro, Norio; and Yamamoto, Kaizo, 4,489,254, Cl. 315-39.510.
Yamamoto, Kimiaki, to Olympus Optical Co., Ltd. Light absorptive film having an anti-reflecting property. 4,488,775, Cl. 350-164.000.
Yamamoto, Nobuhiro: *See*—
Uenobe, Fukuji; Matsuura, Shin; Yamamoto, Nobuhiro; and Shioyama, Masakazu, 4,489,067, Cl. 424-195.000.
Yamamoto, Yutaka, to Alps Electric Co., Ltd. Manufacturing method for a resistance element. 4,489,230, Cl. 219-121.0LM.
Yamanishi, Kazuhiro: *See*—
Kobayashi, Masaaki; Tomita, Masao; Matsumoto, Masayuki; Honjo, Masahiro; and Yamanishi, Kazuhiro, 4,489,352, Cl. 360-10.300.
Yamatsuta, Kohji; and Nishio, Ken-ichi, to Sumitomo Chemical Company, Limited. Fiber-reinforced metal composite material. 4,489,138, Cl. 428-614.000.
Yamauchi, Masahide; and Fukatsu, Kunio, to Tokyo Shibaura Denki Kabushiki Kaisha. Page turning apparatus. 4,488,367, Cl. 40-531.000.
Yamauchi, Yasutaka: *See*—
Sugiura, Kengo; Yamauchi, Yasutaka; and Ito, Hiroshi, 4,488,524, Cl. 123-339.000.
Yankloski, Richard A., to Data-Pac Mailing Systems Corp. Sorting apparatus. 4,488,610, Cl. 177-4.000.
Yannopoulos, Lympexios N., to Westinghouse Electric Corp. Synthetic monazite coated nuclear waste containing glass. 4,488,990, Cl. 252-629.000.
Yasuoka, Nobuyuki, to NEC Corporation. Memory device. 4,489,404, Cl. 365-230.000.
Yazawa, Kenichiro: *See*—
Hatanaka, Isamu; Sekine, Takashi; and Yazawa, Kenichiro, 4,488,810, Cl. 356-244.000.
Yeh, An-I: *See*—
Berg, Lloyd; and Yeh, An-I, 4,488,937, Cl. 203-51.000.
Ying, David H. S., to International Coal Refining Company. Fired heater for coal liquefaction process. 4,488,594, Cl. 165-163.000.
Yocum, Robert R.: *See*—
Barak, Lawrence S.; Nothnagel, Eugene A.; Webb, Watt W.; and Yocum, Robert R., 4,489,001, Cl. 260-112.50R.
Yoda, Haruo: *See*—
Matsuda, Tadahito; Okubo, Tsuneo; Ozasa, Susumu; Saitou, Norio; and Yoda, Haruo, 4,489,241, Cl. 250-491.100.
Yoon, Heeyoung, to Conoco Inc. Cold start method with start-up gaseous fuel generation system for methanol fueled cars. 4,488,517, Cl. 123-3.000.
Yoshida, Hiroshi; Matsuda, Yoshio; and Akashi, Shunji, to Yoshida Kogyo K. K. Separable slide fastener and method of attaching the same to knit fabrics. 4,488,337, Cl. 24-381.000.
Yoshida Kogyo K. K.: *See*—
Takahashi, Kihei, 4,488,338, Cl. 24-389.000.
Yoshida, Hiroshi; Matsuda, Yoshio; and Akashi, Shunji, 4,488,337, Cl. 24-381.000.
Yoshida, Masazumi: *See*—
Kawamura, Takao; and Yoshida, Masazumi, 4,489,149, Cl. 430-65.000.
Yoshida, Takao: *See*—
Light, Kenneth K.; Schreiber, William L.; McGhie, Joseph A.; Schreck, Ronald P.; Yoshida, Takao; Schreiber, Loren B.; and Muralidhara, Ranya, 4,489,009, Cl. 260-465.600.
Yoshida, Yasuhiro, to Mitsubishi Denki Kabushiki Kaisha. Rectifying apparatus for automotive A.C. generator. 4,489,374, Cl. 363-145.000.
Yoshihara, Kenji: *See*—
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; and Yoshihara, Kenji, 4,489,398, Cl. 369-32.000.
Yoshimoto, Hideo: *See*—
Nishiguchi, Takuji; and Yoshimoto, Hideo, 4,488,641, Cl. 206-320.000.
Yoshimura, Motokazo; Takiguchi, Michitaka; Horie, Fujio; and Hirata, Koichi, to Brother Kogyo Kabushiki Kaisha. Device for vocally indicating causes of abnormal conditions of a sewing machine. 4,489,436, Cl. 381-51.000.
Yoshinaga, Kenji; Hashimoto, Kiyoyasu; Okaniwa, Tetsuo; and Kenmochi, Hirohito, to Sumitomo Chemical Company, Limited. Monoazo dyestuffs derived from benzothiazole. 4,488,992, Cl. 534-788.000.
Yoshizaki, Yukio, to Nittan Company, Limited. Selective test circuit for fire detectors. 4,489,312, Cl. 340-514.000.
Yoshizawa, Hiroshi: *See*—
Nishikawa, Masao; Hattori, Torao; Aoki, Takashi; and Yoshizawa, Hiroshi, 4,488,446, Cl. 74-330.000.
Youakim, Phillip M. High-hat cymbal stand and method of setting up the same. 4,488,471, Cl. 84-422.00R.
Young, Carole J.: *See*—
Hawkins, Pamela L.; and Young, Carole J., 4,489,162, Cl. 436-10.000.

Young, Harvey R., to United States of America, Army. Power management system. 4,488,851, Cl. 416-33.000.

Yu, Jiunn S., to United States of America, Energy. Dual-cone double-helical downhole logging device. 4,489,276, Cl. 324-338.000.

Yudenfriend, Herbert. Process and apparatus for forming a window panel having an energy control film laminate. 4,489,134, Cl. 428-412.000.

Yugen Kaisha Go Chuzo Tekko Sho: *See*—
Go, Seitaro, 4,489,037, Cl. 376-261.000.

Yusen, Akira: *See*—
Uesaka, Susumu; Hagiwara, Toshio; Yusen, Akira; Takayama, Minoru; and Urakami, Shinichi, 4,488,817, Cl. 366-149.000.

Yushiro Chemical Industry Co., Ltd.: *See*—
Uenobe, Fukuji; Matsuura, Shin; Yamamoto, Nobuhiro; and Shioyama, Masakazu, 4,489,067, Cl. 424-195.000.

Zahnradfabrik Friedrichshafen, A.G.: *See*—
Tischer, Werner, 4,488,401, Cl. 60-384.000.

Zajac, Charles J.; and Geiersbach, Allois F., to Allis-Chalmers Corporation. Kiln ring grinding apparatus. 4,488,382, Cl. 51-165.920.

Zajber, Adolf G.: *See*—
Hoffmann, Rudolf; and Zajber, Adolf G., 4,488,591, Cl. 164-442.000.

Zaloof, Moshe. Multiple-jaw chuck. 4,488,731, Cl. 279-121.000.

Zampini, Anthony, to Monsanto Company. Amorphous aryl substituted polyarylene oxide membranes. 4,488,886, Cl. 55-158.000.

Zeiler, Hans-Joachim: *See*—
Kinast, Gunther; Boberg, Michael; Metzger, Karl G.; and Zeiler, Hans-Joachim, 4,489,076, Cl. 424-246.000.

Zenith Electronics Corporation: *See*—
Borg, Arthur N., 4,489,394, Cl. 364-900.000.
Godawski, Theodore J., 4,489,253, Cl. 315-8.000.

Zenith Radio Corporation: *See*—
Tentler, Michael, 4,489,347, Cl. 358-118.000.

Zerbe, Lowell B. Apparatus for supporting portable hand tools. 4,488,383, Cl. 51-170.00T.

Ziegler, Alfred: *See*—
Kraicar, Heinz; and Ziegler, Alfred, 4,489,360, Cl. 361-187.000.

Zimmerman, William B.: *See*—
Claassen, George B.; Karlo, Rudolph A.; and Zimmerman, William B., 4,488,893, Cl. 65-287.000.

Zitin, Lynne M.: *See*—
Coffey, Theodore E., 4,489,035, Cl. 264-335.000.

Zulch, Donald I.; and Brock, Robert H., Jr., to United States of America, Air Force. Radar calibration using direct measurement equipment and oblique photometry. 4,489,322, Cl. 343-17.700.

ZVS Adamovske strojirny koncernovy podnik: *See*—
Jiruse, Jaroslav; and Liska, Zbynek, 4,488,484, Cl. 101-248.000.

Zwarycz, Andre : *See*—
Guery, Jean-Pierre; and Zwarycz, Andre , 4,489,296, Cl. 335-197.000.

Zylbert, Thaddeus J.: *See*—
Giaimo, Anthony; and Zylbert, Thaddeus J., 4,488,499, Cl. 112-230.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF DECEMBER, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Anaren Microwave, Incorporated: *See*—
Gerst, Carl W.; Hair, Hugh A.; and Rehnmark, Stig L., Re. 31,772, Cl. 343-373.000.

Atlantic Richfield Company: *See*—
Milkovich, Ralph, Re. 31,770, Cl. 525-314.000.

Brooks, Reginald G., to Osprey Metals Limited. Method and apparatus for making shaped articles from sprayed molten metal or metal alloy. Re. 31,767, Cl. 29-527.200.

Ethyl Corporation: *See*—
McKinnie, Bonnie G.; and Ranken, Paul F., Re. 31,771, Cl. 568-54.000.

Fletcher, David L.; and Stadlin, Walter O., to Leeds & Northrup Company. Measuring system. Re. 31,774, Cl. 364-483.000.

Foley, Gerard M.; and Mosley, Gerald, to Leeds & Northrup Company. Cathode ray tube system with strip chart recorder display format. Re. 31,773, Cl. 358-93.000.

Gerbasi, Dennis P., to Xerox Corporation. Sorting apparatus for collating simplex and duplex copies. Re. 31,768, Cl. 271-291.000.

Gerst, Carl W.; Hair, Hugh A.; and Rehnmark, Stig L., to Anaren Microwave, Incorporated. Digital bearing indicator. Re. 31,772, Cl. 343-373.000.

Hair, Hugh A.: *See*—
Gerst, Carl W.; Hair, Hugh A.; and Rehnmark, Stig L., Re. 31,772, Cl. 343-373.000.

Hargest, Thomas S., III; and Ryan, William C., Jr. Fluid flow connector unit and method. Re. 31,769, Cl. 604-49.000.

Leeds & Northrup Company: *See*—
Fletcher, David L.; and Stadlin, Walter O., Re. 31,774, Cl. 364-483.000.
Foley, Gerard M.; and Mosley, Gerald, Re. 31,773, Cl. 358-93.000.

McKinnie, Bonnie G.; and Ranken, Paul F., to Ethyl Corporation. Process for the preparation of ortho-(hydrocarbylthio)-phenols. Re. 31,771, Cl. 568-54.000.

Milkovich, Ralph, to Atlantic Richfield Company. Derivatization of star-block copolymers. Re. 31,770, Cl. 525-314.000.

Mosley, Gerald: *See*—
Foley, Gerard M.; and Mosley, Gerald, Re. 31,773, Cl. 358-93.000.

Osprey Metals Limited: *See*—
Brooks, Reginald G., Re. 31,767, Cl. 29-527.200.

Ranken, Paul F.: *See*—
McKinnie, Bonnie G.; and Ranken, Paul F., Re. 31,771, Cl. 568-54.000.

Rehnmark, Stig L.: *See*—
Gerst, Carl W.; Hair, Hugh A.; and Rehnmark, Stig L., Re. 31,772, Cl. 343-373.000.

Ryan, William C., Jr.: *See*—
Hargest, Thomas S., III; and Ryan, William C., Jr., Re. 31,769, Cl. 604-49.000.

Stadlin, Walter O.: *See*—
Fletcher, David L.; and Stadlin, Walter O., Re. 31,774, Cl. 364-483.000.

Xerox Corporation: *See*—
Gerbasi, Dennis P., Re. 31,768, Cl. 271-291.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Barosi, Aldo, to S.A.E.S. Getters S.p.A. Gettering structure. B1 3,926,832, 12-18-84, Cl. 252-181.600.

Benevenuta, Gianfranco. Closure device for container doors. B1 4,235,463, 12-18-84, Cl. 292-218.000.

Collins, Dean E., to Root-Lowell Manufacturing Co. Sprayer nozzle. B1 3,963,178, 12-18-84, Cl. 239-8.000.

Diana, Guy D., to Sterling Drug Inc. Arylalkyl and aryloxyalkyl phosphonates and use as antiviral agents. B1 4,182,759, 12-18-84, Cl. 424-217.000.

Iwasaki, Akio: *See*—
Watanabe, Isamu; Iwasaki, Akio; and Mori, Toshihito, B1 4,255,421, Cl. 424-180.000.

Kowa Company, Ltd.: *See*—
Watanabe, Isamu; Iwasaki, Akio; and Mori, Toshihito, B1 4,255,421, Cl. 424-180.000.

Mori, Toshihito: *See*—
Watanabe, Isamu; Iwasaki, Akio; and Mori, Toshihito, B1 4,255,421, Cl. 424-180.000.

Root-Lowell Manufacturing Co.: *See*—
Collins, Dean E., B1 3,963,178, Cl. 239-8.000.

S.A.E.S. Getters S.p.A.: *See*—
Barosi, Aldo, B1 3,926,832, Cl. 252-181.600.

Sterling Drug Inc.: *See*—
Diana, Guy D., B1 4,182,759, Cl. 424-217.000.

Watanabe, Isamu; Iwasaki, Akio; and Mori, Toshihito, to Kowa Company, Ltd. [Fortimicin] Aminoglycosides, process for production thereof, and use thereof. B1 4,255,421, 12-18-84, Cl. 424-180.000.

LIST OF DESIGN PATENTEES

Aktiebolaget Draco: *See*—
Nyman, Sven G.; Snellman-Wasenius, Kaija A.; and Virtanen, Risto, 276,847, Cl. D24-62.000.

Allender, David G., Jr. Portable electrical resistance sensing wand. 276,796, 12-18-84, Cl. D10-56.000.

Alon Products Inc.: *See*—
Ravreby, Fred A., 276,788, Cl. D8-42.000.

American Cyanamid Co.: *See*—
Mansau, Serge, 276,792, Cl. D9-403.000.

American Greetings Corporation: *See*—
Winslow, David; and Toth, Stephen M., 276,832, Cl. D21-114.000.

American Standard Inc.: *See*—
Bateman, John L., 276,821, Cl. D19-11.000.

AMF Inc.: *See*—
Joss, Michael S.; and Belletire, Steven P., 276,795, Cl. D10-40.000.

Antti, Richard D.; and Jason, William, to Jason & Son, Inc. Combined bulk food display and dispenser cabinet. 276,775, 12-18-84, Cl. D6-471.000.

Appel, Mel; and Kress, George, to Appel, Mel. Toy phonograph. 276,831, 12-18-84, Cl. D21-112.000.

Bailly, Francois, to Equipements Automobiles Marchal. Headlight. 276,849, 12-18-84, Cl. D26-29.000.

Ball-Master Golf Club Company, Inc.: *See*—
Cook, Raymon W., 276,836, Cl. D21-220.000.

Bateman, John L., to American Standard Inc. Combined check and check stub. 276,821, 12-18-84, Cl. D19-11.000.

Bays, Marvin G.; and Carothers, James L., to Mertz, Inc. Seismic exploration vehicle. 276,799, 12-18-84, Cl. D12-1.000.

Bays, Marvin G.; and Carothers, James L., to Mertz, Inc. Seismic exploration vehicle. 276,800, 12-18-84, Cl. D12-1.000.

Bays, Marvin G.; and Carothers, James L., to Mertz, Inc. Seismic exploration vehicle. 276,801, 12-18-84, Cl. D12-1.000.
Belletire, Steven P.: *See*—
Joss, Michael S.; and Belletire, Steven P., 276,795, Cl. D10-40.000.
Berger, Robert M., to Intercon Purchasing Industries (U.S.A.) Ltd. Lamp. 276,852, 12-18-84, Cl. D26-62.000.
Bernatek, Eugene S. Aerial toy. 276,829, 12-18-84, Cl. D21-98.000.
Billeck, Frank D.: *See*—
Narens, Robert L.; and Billeck, Frank D., 276,797, Cl. D10-109.000.
Borst, Rodney D., to Placon Corporation. Tape dispenser. 276,822, 12-18-84, Cl. D19-69.000.
Bradley, Hall, to Brown Jordan Company. Table frame. 276,778, 12-18-84, Cl. D6-499.000.
Brio Toy AB: *See*—
Petersson, Nils A. I., 276,830, Cl. D21-108.000.
Brown Jordan Company: *See*—
Bradley, Hall, 276,778, Cl. D6-499.000.
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422 S 4,488,470
434 4,488,472

CLASS 91

50 4,488,473
446 4,488,474
462 4,488,475
513 4,488,476

CLASS 92

85 R 4,488,477

CLASS 99

330 4,488,478
345 4,488,479
386 4,488,480
517 4,488,481

CLASS 100

37 4,488,482

CLASS 101

178 4,488,483
248 4,488,484
350 4,488,485

CLASS 102

275.1 4,488,486
382 4,488,487
387 4,488,488
489 4,488,489
513 4,488,490
522 4,488,491

CLASS 104

12 4,488,492
172 S 4,488,493

CLASS 105

215 C 4,488,494
224.1 4,488,495

CLASS 106

14.11 4,488,907
75 4,488,908
89 4,488,909
90 4,488,910
161 4,488,911

CLASS 108

51.3 4,488,496
144 4,488,497

CLASS 112

80 4,488,498
230 4,488,499

CLASS 114

74 A 4,488,500
230 4,488,501
4,488,502
260 4,488,503

CLASS 118

60 4,488,504
630 4,488,505
667 4,488,506
726 4,488,507

CLASS 119

3 4,488,508
53 4,488,509
60 4,488,510
109 4,488,511

CLASS 122

4 D 4,488,512
32 4,488,513
149 4,488,514
379 4,488,515
4,488,516

CLASS 123

3 4,488,517
41.49 4,488,518
52 M 4,488,519
90.39 4,488,520
179 BG 4,488,521
193 CP 4,488,522
339 4,488,524
352 4,488,525
357 4,488,526
399 4,488,527
425 4,488,528
438 4,488,529
477 4,488,530
559 4,488,531
4,488,532
569 4,488,533

CLASS 126

25 A 4,488,535
25 R 4,488,534
96 4,488,536
360 A 4,488,537
390 4,488,538
433 4,488,539
438 4,488,540

CLASS 127

41 4,488,912

CLASS 128

79 4,488,541
92 A 4,488,542
92 BB 4,488,543
134 4,488,544
200.26 4,488,545
201.23 4,488,546
202.22 4,488,547
204.25 4,488,548
303 R 4,488,549
316 4,488,550
334 R 4,488,523
360 4,488,551
402 4,488,552
419 PG 4,488,553
4,488,554
419 PT 4,488,555
635 4,488,556
4,488,557
642 4,488,558
653 4,488,559
738 4,488,560
786 4,488,561

CLASS 131

79 4,488,562
336 4,488,563

CLASS 132

7 4,488,564

CLASS 135

100 4,488,565

CLASS 137

74 4,488,566
78.1 4,488,567
78.2 4,488,568
101 4,488,569
238 4,488,570
315 4,488,571
4,488,572
375 4,488,573
487.5 4,488,574
499 4,488,575
625.21 4,488,576

CLASS 138

127 4,488,577
146 4,488,578

CLASS 139

196.2 4,488,579
336 4,488,580

CLASS 140

147 4,488,581

CLASS 141

95 4,488,582
311 R 4,488,583
339 4,488,584

CLASS 144

193 D 4,488,585
363 4,488,586

CLASS 148

12.7 A 4,488,913
175 4,488,914
404 4,488,915

CLASS 149

2 4,488,916

CLASS 152

359 4,488,587

CLASS 156

39 4,488,917
79 4,488,918
153 4,488,919
155 4,488,920
172 4,488,921
192 4,488,922
199 4,488,5[illegible]3
251 4,488,924
351 4,488,925
379.8 4,488,926
464 4,488,927
495 4,488,928
553 4,488,929
616 R 4,488,930
643 4,488,931

CLASS 160

178 C 4,488,588

CLASS 162

9 4,488,932

CLASS 164

155 4,488,589
423 4,488,590
442 4,488,591

CLASS 165

104.31 4,488,592
151 4,488,593
163 4,488,594

CLASS 166

206 4,488,595
217 4,488,596
250 4,488,597
252 4,488,598
255 4,488,599
263 4,488,600
270 4,488,601
274 4,488,602

CLASS 169

24 4,488,603

CLASS 173

12 4,488,604

CLASS 174

35 C 4,489,217
35 R 4,489,218
128 S 4,489,219

CLASS 175

18 4,488,605
57 4,488,606
65 4,488,607
374 4,488,608
410 4,488,609

CLASS 177

4 4,488,610
170.2 4,489,222
211 4,488,611

CLASS 179

2 AM 4,489,220
19 4,489,221

CLASS 180

14.1 4,488,612
89.15 4,488,613
127 4,488,614
148 4,488,615
185 4,488,616
209 4,488,617
219 4,488,618

CLASS 181

290 4,488,619

CLASS 182

135 4,488,620

CLASS 187

70 4,488,621

CLASS 188

72.3 4,488,622

CLASS 190

12 A 4,488,623
120 4,488,624

CLASS 191

12.2 R 4,489,223

CLASS 192

3.58 4,488,625
44.2 4,488,627
58 B 4,488,628
70.12 4,488,626
106.1 4,488,629
134 4,488,630

CLASS 198

335 4,488,631
420 4,488,632
472 4,488,633
493 4,488,634
504 4,488,635
608 4,488,636
653 4,488,637

781 4,488,638
787 4,488,639

CLASS 200

84 C 4,489,224
144 R 4,489,225
148 A 4,489,226
314 4,489,227

CLASS 202

83 4,488,933
158 4,488,934
177 4,488,935

CLASS 203

1 4,488,936
51 4,488,937

CLASS 204

1 T 4,488,938
4,488,939
4 4,488,940
15 4,488,941
44.2 4,488,942
58.5 4,488,943
79 4,488,944
95 4,488,945
98 4,488,946
4,488,947
4,488,948
116 4,488,950
129 4,488,951
158 R 4,488,952
163 R 4,488,953
169 4,488,954
243 R 4,488,955
298 4,488,956

CLASS 206

229 4,488,640
320 4,488,641
345 4,488,642
366 4,488,643
387 4,488,644
444 4,488,645
459 4,488,646
525 4,488,647

CLASS 208

40 4,488,957

CLASS 209

2 4,488,958
167 4,488,959
526 4,488,648

CLASS 210

97 4,488,960
136 4,488,961
138 4,488,962
170 4,488,963
182 4,488,964
232 4,488,965
485 4,488,966
605 4,488,967
4,488,968
679 4,488,969
746 4,488,970
751 4,488,971

CLASS 211

49 S 4,488,649
105 4,488,650
105.6 4,488,651
183 4,488,652
184 4,488,653

CLASS 215

252 4,488,655
303 4,488,657
307 4,488,656

CLASS 219

56.22 4,489,228
100 4,489,229
121 LM 4,489,230
137 R 4,489,231
206 4,489,232
242 4,489,233
347 4,489,234
437 4,489,235

CLASS 220

276 4,488,658
416 4,488,659
425 4,488,660
462 4,488,661

CLASS 221

197 4,488,662

CLASS 222

43 4,488,663
56 4,488,664
146.5 4,488,665
485 4,488,667
548 4,488,668
651 4,488,666

CLASS 224

273 4,488,669

CLASS 226

10 4,488,670
79 4,488,671

CLASS 227

156 4,488,672

CLASS 228

122 4,488,673
179 4,488,674

CLASS 229

33 4,488,675
43 4,488,676

CLASS 232

34 4,488,677

CLASS 235

463 4,488,678
469 4,488,679

CLASS 236

93 A 4,488,680

CLASS 237

55 4,488,681

CLASS 239

8 B1 3,963,178
132.3 4,488,682
199 4,488,683
222 4,488,684

CLASS 242

4 BE 4,488,685
18 G 4,488,686
56 A 4,488,687
78 4,488,688
84.5 A 4,488,689
192 4,488,690

CLASS 244

55 4,488,692
116 4,488,693
151 R 4,488,691
152 4,488,694

CLASS 248

62 4,488,695
74.1 4,488,696
101 4,488,697
188 4,488,698
396 4,488,699
633 4,488,700
637 4,488,701

CLASS 250

252.1 4,489,236
287 4,489,237
338 4,489,238
339 4,489,239
474.1 4,489,240
491.1 4,489,241

CLASS 251

46 4,488,702
77 4,488,703
265 4,488,704

CLASS 252

8.55 D 4,488,976
8.55 R 4,488,975
8.6 4,488,972
4,488,973
8.8 4,488,974
12.4 4,488,977
70 4,488,978
79 4,488,979
99 4,488,980
174.17 4,488,981
174.21 4,488,982
181.6 B1 3,926,832
301.4 H 4,488,983
313 R 4,488,984
400 A 4,488,985
500 4,488,986
520 4,488,987
522 R 4,488,988
541 4,488,989
629 4,488,990

CLASS 254

108 4,488,705
131 4,488,706
243 4,488,707
355 4,488,708
423 4,488,709

CLASS 260

112 R 4,488,991
112.5 R 4,489,001
239 A 4,488,993
239.1 4,488,994
239.3 P 4,489,003
397.45 4,488,995
410.9 R 4,488,996
414 4,488,997
4,488,998
429 R 4,488,999
4,489,004
429.2 4,489,000
430 4,489,005
462 R 4,489,006
465 F 4,489,007
465.4 4,489,008
465.6 4,489,009
501.11 4,489,010
501.19 4,489,011
946 4,489,012
968 4,489,013

CLASS 261

44 C 4,489,014
92 4,489,015
122 4,489,016

CLASS 264

4.7 4,489,017
25 4,489,018
26 4,489,019
4,489,020
27 4,489,021
30 4,489,022
54 4,489,023
71 4,489,024
104 4,489,025
123 4,489,026
137 4,489,027
154 4,489,028
174 4,489,029
293 4,489,030
294 4,489,031
325 4,489,032
328.7 4,489,033
331.15 4,489,034
335 4,489,035

CLASS 266

114 4,488,710
276 4,488,711

CLASS 267

91 4,488,712

CLASS 269

25 4,488,713
303 4,488,714
328 4,488,715

CLASS 271

3 4,488,716
4,488,717
127 4,488,718
291 Re.31,768

CLASS 272

72 4,488,719

CLASS 273

67 A 4,488,721
73 D 4,488,722
129 S 4,488,724
129 T 4,488,723
153 S 4,488,725
183 B 4,488,726
236 4,488,727
239 4,488,720
423 4,488,728

CLASS 277

15 4,488,729
18 4,488,730

CLASS 279

121 4,488,731

CLASS 280

47.16 4,488,733
605 4,488,734
656 4,488,735
723 4,488,736
781 4,488,732

CLASS 281

31 4,488,737

CLASS 285

40 4,488,738
55 4,488,739
84 4,488,740
250 4,488,741
325 4,488,742
368 4,488,743
408 4,488,744

CLASS 292

218 B1 4,235,463

CLASS 293

155 4,488,745

CLASS 294

86 R 4,488,746
86.1 4,488,747
147 4,488,748
815 F 4,488,749

CLASS 296

78 R 4,488,750
146 4,488,751
171 4,488,752
201 4,488,753

CLASS 297

216 4,488,754
443 4,488,755

CLASS 298

19 B 4,488,756

CLASS 299

32 4,488,757
81 4,488,758
4,488,759

CLASS 300

21 4,488,760

CLASS 301

6 E 4,488,761

CLASS 307

10 R 4,489,242
64 4,489,243
296 R 4,489,244
4,489,245
448 4,489,246
477 4,489,247

CLASS 310

76 4,489,248
216 4,489,249
313 A 4,489,250

CLASS 312

39 4,488,654
348 4,488,762

CLASS 313

105 CM 4,489,251
318 4,489,252

CLASS 315

8 4,489,253
39.51 4,489,254
73 4,489,255

CLASS 318

87 4,489,256
258 4,489,257
317 4,489,258
696 4,489,259
4,489,260
700 4,489,261
4,489,262
727 4,489,263
729 4,489,264
773 4,489,265
800 4,489,266
811 4,489,267

CLASS 320

2 4,489,268

CLASS 322

2 R 4,489,269
35 4,489,290

CLASS 323

354 4,489,270

CLASS 324

58 B 4,489,271
73 R 4,489,272
166 4,489,273
248 4,489,274
315 4,489,275
338 4,489,276
425 4,489,277
457 4,489,278

CLASS 328

134 4,489,279
139 4,489,280

CLASS 330

129 4,489,281
261 4,489,282
268 4,489,283
277 4,489,284
288 4,489,285
303 4,489,286

CLASS 331

1 A 4,489,287
87 4,489,288
107 A 4,489,289

CLASS 333

202 4,489,292
4,489,293

CLASS 335

20 4,489,295
197 4,489,296
207 4,489,297
209 4,489,294

CLASS 336

70 4,489,298

CLASS 337

4,489,299
186 4,489,300
401 4,489,301

CLASS 338

99 4,489,302
128 4,489,303
4,489,304
200 4,489,291

CLASS 339

17 F 4,488,763
37 4,488,764
42 4,488,765
75 MP 4,488,766
91 R 4,488,767
99 R 4,488,768
103 M 4,488,769
263 R 4,488,770
278 D 4,488,771

CLASS 340

57 4,489,305
107 4,489,306
134 4,489,307
286 R 4,489,308
347 AD 4,489,309
365 VL 4,489,310
501 4,489,311
514 4,489,312
540 4,489,313
568 4,489,314
600 4,489,315
700 4,489,316
726 4,489,317
825.34 4,489,318

CLASS 343

7 A 4,489,319
7.7 4,489,320
8 4,489,321
17.7 4,489,322
372 4,489,324
373 Re.31,772
374 4,489,325
408 4,489,326
432 4,489,327
700 MS 4,489,328
705 4,489,329
742 4,489,330
753 4,489,331

CLASS 346

74.2 4,489,332
104 R 4,489,334
139 R 4,489,333
140 R 4,489,335
209 4,489,336
4,489,337

CLASS 350

96.20 4,488,773
99 4,488,774
164 4,488,775
242 4,488,776
279 4,488,777
320 4,488,780
331 R 4,488,772
337 4,488,786
357 4,488,781
4,488,782
4,488,783
359 4,488,784
360 4,488,785
429 4,488,787
465 4,488,788
486 4,488,789
549 4,488,790
582 4,488,791
631 4,488,778
632 4,488,779

CLASS 351

153 4,488,792

CLASS 354

1 4,488,793
83 4,488,794
115 4,488,795
275 4,488,796
298 4,488,797
402 4,488,798
406 4,488,799
445 4,488,800

CLASS 355

3 CH 4,488,802
3 SH 4,488,801
28 4,488,803
56 4,488,804
69 4,488,805
77 4,488,806
83 4,488,807

CLASS 356

73 4,488,808
138 4,488,809
244 4,488,810
319 4,488,811
338 4,488,812
375 4,488,813
414 4,488,814

CLASS 357

23 4,489,338
4,489,339
38 4,489,340
51 4,489,341

CLASS 358

17 4,489,342
4,489,343
22 4,489,344
29 4,489,345
31 4,489,346
93 Re.31,773
118 4,489,347
149 4,489,348
168 4,489,349
213 4,489,350
4,489,351

CLASS 360

10.3 4,489,352
25 4,489,353
64 4,489,354
96.5 4,489,355
97 4,489,356
113 4,489,357
137 4,489,358

CLASS 361

172 4,489,359
187 4,489,360
333 4,489,361
339 4,489,362
383 4,489,363
395 4,489,364
403 4,489,365

CLASS 362

270 4,489,366
311 4,489,367
368 4,489,368

CLASS 363

21 4,489,369
26 4,489,370
41 4,489,371
54 4,489,372
56 4,489,373
87 4,489,323
145 4,489,374

CLASS 364

157 4,489,375
165 4,489,376
167 4,489,377
200 4,489,378
4,489,379
4,489,380
4,489,381
426 4,489,382
434 4,489,383
483 Re.31,774
4,489,384
493 4,489,385
4,489,386
514 4,489,387
517 4,489,388
522 4,489,389
724 4,489,390
4,489,391
4,489,392
728 4,489,393
900 4,489,394
4,489,395
4,489,396
4,489,397

CLASS 365

104 4,489,399
4,489,400
200 4,489,401
4,489,402
4,489,403
230 4,489,404

CLASS 366

8 4,488,815
116 4,488,816
149 4,488,817

CLASSIFICATION OF PATENTS

CLASS 367
116 4,489,405

CLASS 368
71 4,488,818
220 4,488,819
273 4,488,820

CLASS 369
32 4,489,398
4,489,406
77.2 4,489,407
112 4,489,408
126 4,489,409
270 4,489,410

CLASS 370
11 4,489,411
16 4,489,412
30 4,489,413

CLASS 371
20 4,489,414

CLASS 372
38 4,489,415

CLASS 374
44 4,488,821
101 4,488,822
170 4,488,823
181 4,488,824

CLASS 375
13 4,489,416
17 4,489,417
27 4,489,418
36 4,489,419
94 4,489,420
112 4,489,421

CLASS 376
229 4,489,036
261 4,489,037
446 4,489,038

CLASS 377
28 4,489,422
58 4,489,423
93 4,489,424

CLASS 378
72 4,489,425
150 4,489,426
170 4,489,427
176 4,489,428

CLASS 381
7 4,489,430
15 4,489,431
24 4,489,432
41 4,489,433
43 4,489,434
4,489,435
51 4,489,429
4,489,436
4,489,437
4,489,438
63 4,489,439
70 4,489,440
71 4,489,441
81 4,489,442

CLASS 384
152 4,488,825
288 4,488,826

CLASS 400
17 4,488,827
82 4,488,828
605 4,488,829
636 4,488,830

CLASS 403
209 4,488,831
316 4,488,832

CLASS 404
35 4,488,833

CLASS 405
58 4,488,834
83 4,488,835
159 4,488,836

CLASS 406
34 4,488,837
56 4,488,838

CLASS 407
43 4,488,839

CLASS 408
231 4,488,840

CLASS 409
292 4,488,841

CLASS 411
33 4,488,842
41 4,488,843
85 4,488,844

CLASS 412
10 4,488,845

CLASS 414
152 4,488,846
222 4,488,847
460 4,488,848
566 4,488,849
723 4,488,850

CLASS 416
33 4,488,851

CLASS 417
211.5 4,488,852
240 4,488,853
241 4,488,854
368 4,488,855
409 4,488,856
490 4,488,857

CLASS 418
195 4,488,858

CLASS 420
463 4,489,039
584 4,489,040

CLASS 422
186.22 4,489,041

CLASS 423
20 4,489,042
49 4,489,043
53 4,489,044
79 4,489,045
88 4,489,046
230 4,489,047
416 4,489,048
644 4,489,049
4,489,050
4,489,051

CLASS 424
1.1 4,489,052
4,489,053
4,489,054
7.1 4,489,055
22 4,489,056
47 4,489,057
78 4,489,058
106 4,489,059
4,489,060
177 4,489,061
4,489,062
178 4,489,063
4,489,064
180 4,489,065
B1 4,255,421
181 4,489,066
195 4,489,067
200 4,489,068
202 4,489,069
217 B1 4,182,759
243 4,489,070
4,489,071
246 4,489,072
4,489,073
4,489,074
4,489,075
4,489,076
4,489,077
251 4,489,078
260 4,489,079
4,489,080
269 4,489,081
4,489,082
270 4,489,083
4,489,084
273 P 4,489,085
273 R 4,489,086
4,489,087
4,489,089
275 4,489,090
278 4,489,091
304 4,489,092
4,489,093
310 4,489,094
315 4,489,095
317 4,489,096
318 4,489,097
333 4,489,098

CLASS 425
6 4,488,859
131.1 4,488,860
379 R 4,488,861
405 R 4,488,862
530 4,488,863

CLASS 426
3 4,489,099
422 4,489,100

CLASS 427
39 4,489,101
54.1 4,489,102
85 4,489,103
101 4,489,104
123 4,489,105
154 4,489,106
162 4,489,107
164 4,489,108
230 4,489,109
250 4,489,110

CLASS 428
11 4,489,111
35 4,489,112
36 4,489,113
4,489,114
62 4,489,115
138 4,489,116
147 4,489,117
154 4,489,118
167 4,489,119
182 4,489,120
192 4,489,121
212 4,489,122
213 4,489,123
220 4,489,124
235 4,489,125
246 4,489,126
266 4,489,127
332 4,489,128
366 4,489,129
378 4,489,130
391 4,489,131
408 4,489,132
4,489,133
412 4,489,134
423.1 4,489,135
606 4,489,136
610 4,489,137
614 4,489,138
621 4,489,139
654 4,489,140

CLASS 429
23 4,489,141
26 4,489,142
103 4,489,143
196 4,489,144
197 4,489,145

CLASS 430
5 4,489,146
13 4,488,864
58 4,489,147
59 4,489,148
65 4,489,149
106 4,489,150
138 4,489,151
229 4,489,152
253 4,489,153
4,489,154
505 4,489,155

CLASS 431
1 4,488,865
4 4,488,866
12 4,488,867
243 4,488,868
352 4,488,869

CLASS 432
11 4,488,870
19 4,488,871

CLASS 433
5 4,488,872
71 4,488,873
173 4,488,874
4,488,875

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